SERVICE MANUAL

SANYO

COMPACT DISC PLAYER

V08109

CP 900 BLACK
(EUROPE/ITALY)

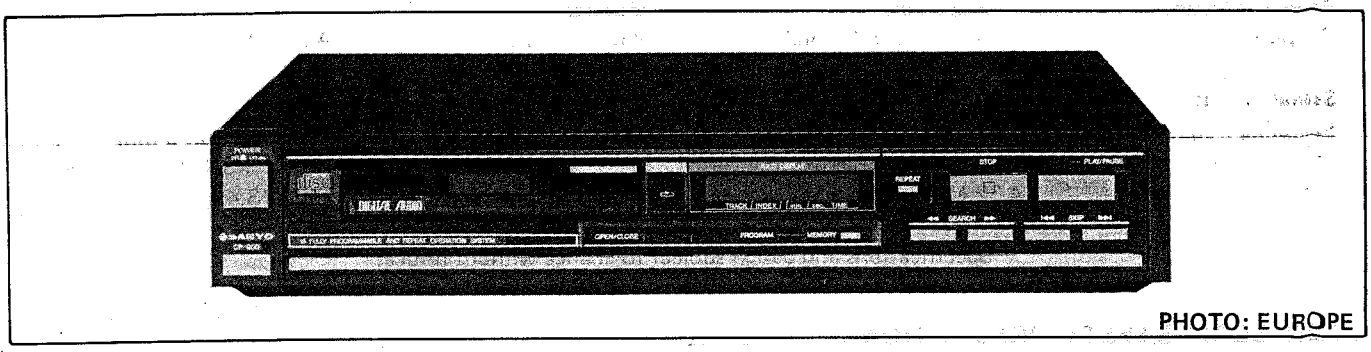

PHOTO: EUROPE

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WM-17538

SPECIFICATIONS

NOTE:
The below mentioned specifications are mainly based on the IHF measurements standard. They can therefore not directly be compared with specifications based on the DIN standard or other standards.

Audio

Channels	2 channels
Frequency response	5 – 20,000 Hz
Dynamic range	96 dB
Channel separation	92 dB (1 kHz)
Distortion	0.005% (1 kHz)
Wow and flutter	Undetectable
Outputs	Output: 1.8V/1 k ohms

Signal format

Sampling frequency	44.1 kHz
Quantization	16 bits linear/channel
Transmission rate	4.32 Mbit/sec.

Pickup

System	Objective drive system light pickup
Light source	Semiconductor laser
Wave length	790 nm

General

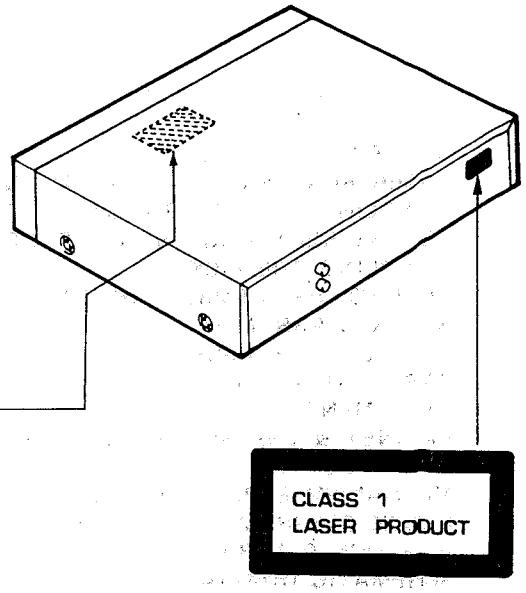
Power supply	AC 220 V, 50 Hz
Power consumption	14 W
Dimensions (approx.)	(W x H x D)
	420 x 77 x 270 mm
	16-1/2"x3-1/16"x10-5/8"
Weight (approx.)	7 lbs. (3.4 kg) 8 ozs.

Specifications and design subject to change without notice.

LASER BEAM SAFETY PRECAUTIONS

(1) A pick-up that emits a laser beam is used in this compact disc player.

CAUTION – INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCKS DEFEATED. AVOID EXPOSURE TO BEAM.
ADVARSEL – USYNLIG LASERSTRÅLING VED ÅBNING, NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.
VARNING – OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRR ÄR URKOPPLAD. STRÅLEN ÄR FARLIG.
VORSICHT – UNSICHTBARE LASERSTRAHLUNG TRITT AUS, WENN DECKEL GEÖFFNET UND WENN SICHERHEITSVERRIEGELUNG ÜBERBRÜCKT IST. NICHT DEM STRAHL AUSSETZEN.
VAROITUS ! LAITE SISÄLTÄÄ LASERDIODIN, JOKA LÄHETTÄÄ NÄKYMÄTÖNTÄ, SILMILLE VAARALLISTA INFRAPUNASÄTEILYÄ. LAITTEEN SISÄLLÄ ON LASERDIODIN LÄHEISYYDESSÄ KUVAN MUKAINEN VAROITUSMERKKI.



ACHTUNG – WENN ANDERE ALS DIE HIER SPEZIFIZIERTEN BEDIENUNGS- ODER JUSTIEREINRICHTUNGEN BENÜTZT ODER ANDERE VERFAHRENS-WEISEN AUSGEFÜHRT WERDEN, KANN DIES ZU GEFÄHRLICHER STRAHLUNGSEXPOSION FÜHREN.

ATTENTION – L'EMPLOI D'ORGANES DE COMMANDE OU DE RÉGLAGE, OU L'EXÉCUTION DE PROCÉDURES, AUTRES QUE CEUX SPÉCIFIÉS DANS LE MODE D'EMPLOI, PEUT PROVOQUER UNE EXPOSITION DANGEREUSE AU RAYONNEMENT.

CAUTION – USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

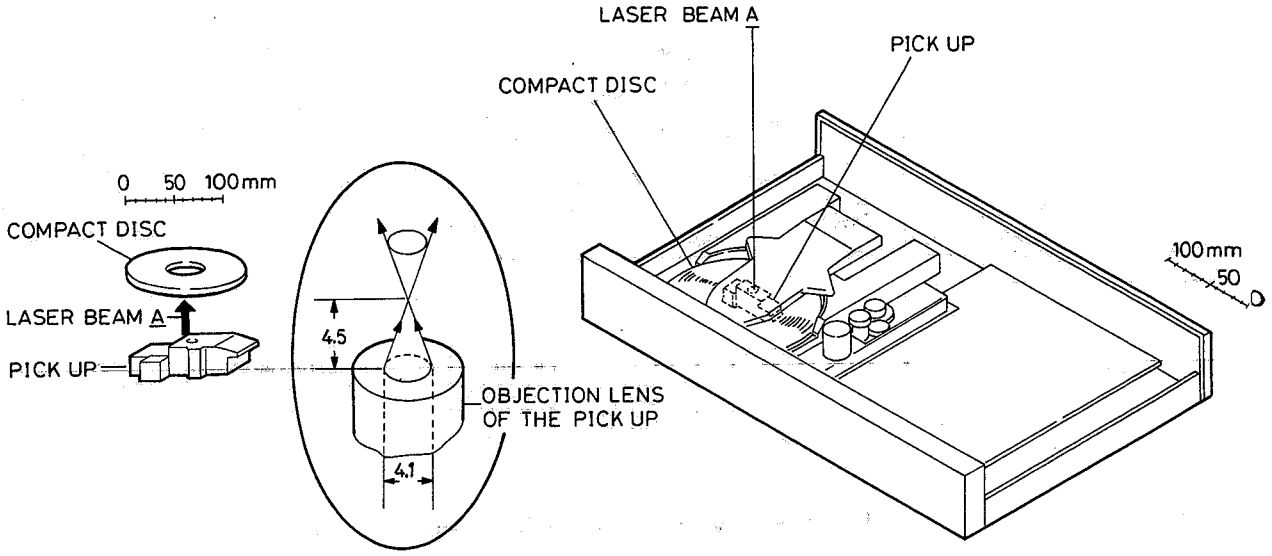
OPGELET – HET GEBRUIK VAN REGELAARS OF HET MAKEN VAN AFSTELLINGEN E.D. DIE NIET IN DEZE GEBRUIKSAANWIJZING ZIJN BESCHREVEN KAN LEIDEN TOT SCHADELIJKE STRALINGEN.

VARNING – BRUK AV KONTROLLER, JUSTERINGAR ELLER MANÖVRERING AV APPARATEN ANNAT ÄN HÄRI ANGIVNA KAN INNEBÄRA STRÅLNINGSRISK.

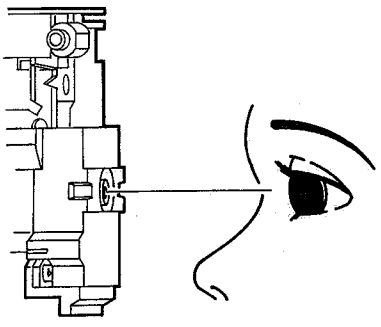
CAUTELA – L'USO DI COMANDI, AGGIUSTAMENTI O PROCEDIMENTI DIVERSO DA QUELLO QUI SPECIFICATO PUÒ DAR LUOGO AD ESPOSIZIONE A RADIAZIONI PERICOLOSE.

LASER BEAM SAFETY PRECAUTIONS

(2) The laser beam is emanated from the location shown in the figure.



If the disc pressure lever is removed, the pick-up is exposed.
Do not look at the pick-up with the power switch ON.



Do not look directly at the laser beam coming from the pick-up or allow it to strike against your fingers, skin, etc.

Do not apply power if there is a broken part in the laser output section of the pick-up.

LASER BEAM SAFETY PRECAUTIONS

(3) Description of safety interlock circuit.

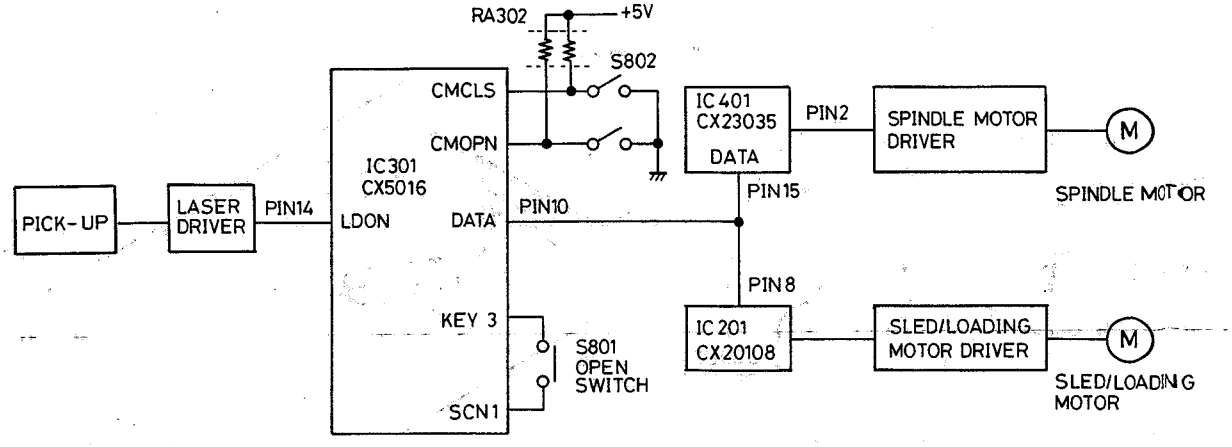


Fig. 1 Safety Interlock Circuit Diagram

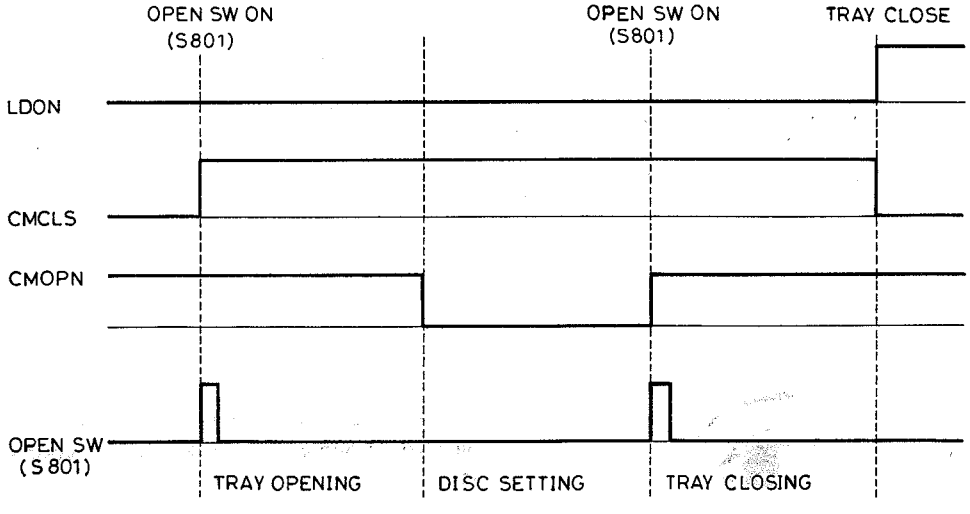


Fig. 2 Time Chart of IC pins

LASER BEAM SAFETY PRECAUTIONS

Function of the IC pins of Fig. 1.

IC301
LDON (pin 14) : Signal which turns laser power ON.
IC302
CMCLS (pin 29) : Signal showing that disc tray is completely closed (Low Active).
CMOPN (pin 28) : Signal showing that disc tray is completely open (Low Active).

Safety Interlock Operation

1) Press OPEN/CLOSE button.
2) When the disc is opened, CMCLS (IC301, pin 29) goes from "Low" to "High" by Tray OPN/CLS switch (S801).

Please refer to Fig. 3. It shows Tray OPEN switch (S801) location.

3) When disc tray is completely open, CMOPN (IC302, pin 14) becomes "Low".
4) Place a disc on disc tray, and press OPEN/CLOSE button.
5) When the disc is closed, CMOPN goes from "Low" to "High".
6) When disc tray is completely closed, CMCLS goes from "High" to "Low".

Summary

- A disc is placed on the disc tray.
- The disc tray is completely closed.
- Operation key is pressed.

When the above conditions are fulfilled, the IC301 LDON terminal (pin 4) becomes "High", thus emitting the laser beam.

Structural Safety Interlock

This model has a disc chuck lever and top lid. This disc chuck lever and top lid prevent to expose the laser beam for users.

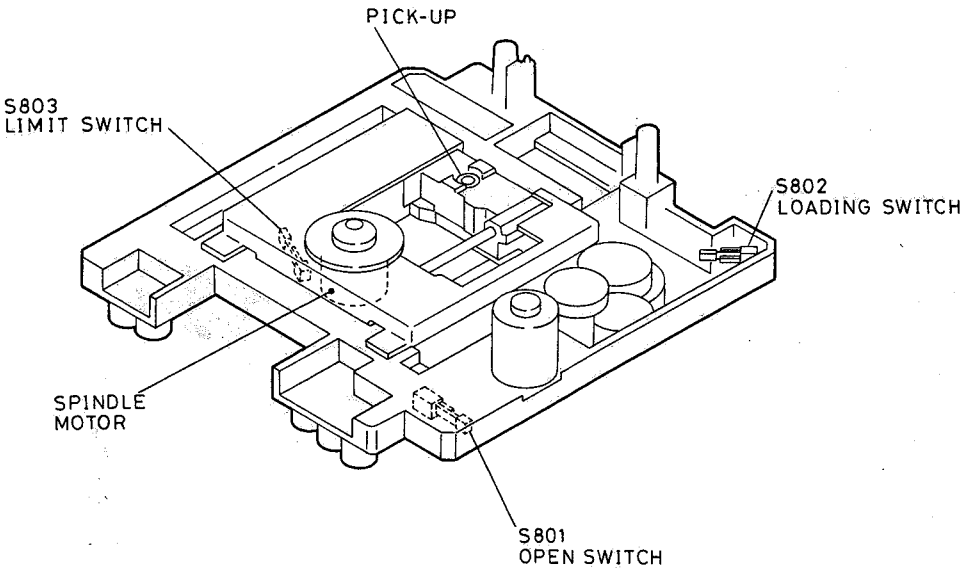


Fig. 3 Mechanism Parts Location

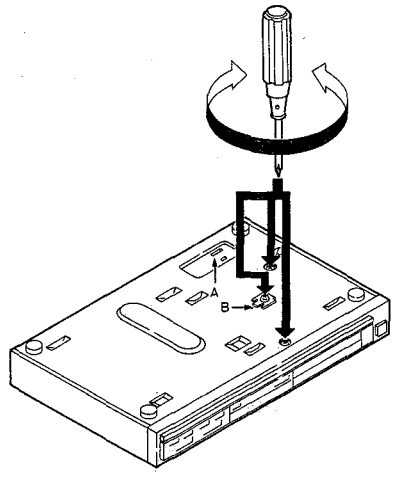
HANDLING OF THE TRANSPORT SCREWS

The mechanism of this model has been secured with two transport screws and the transportation bracket (located on the bottom of the unit) before shipment to prevent damage to the mechanism during transportation.

(1) When the two transport screws and the transportation bracket are tightened to secure the mechanism, allow the mechanism to operate by taking the following procedures.
With a screwdriver, fully loosen the two transport screws (turn about 8 or 9 times) located on the bottom of the unit, until the screws idle freely.
Remove the transportation bracket from the place "B" and mount it to the place "A".

Before repairing the compact disc player, be sure to check that the two transport screws are properly loosened and the transportation bracket is dismounted from place "B". Only after that, it is allowed to turn the POWER switch to ON.

(2) For transporting the unit again after repairing, be sure to take the following procedures to retighten the two transport screws and mount the bracket to place "B".
1. Release the POWER switch to OFF.
2. Press the POWER switch to ON and wait for about 10 seconds.
3. Release the POWER switch to OFF.
4. Fully tighten the two transport screws.
5. Mount the transportation bracket to place "B".



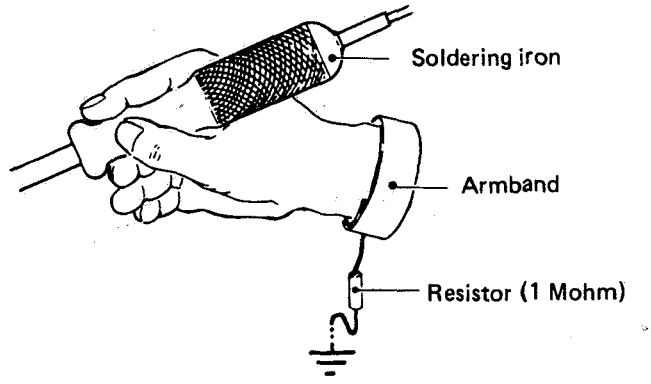
If the transport screws are not tightened, the mechanism may be damaged during transportation.

BEFORE REPAIRING THE COMPACT DISC PLAYER

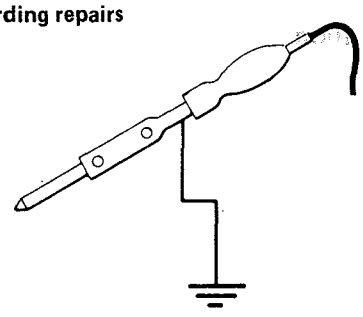
(1) Preparations

a. Many ICs, LSI and the pick-up (laser diode) are used in the compact disc player. These components are sensitive to static electricity, and might be damaged by static electricity or high voltage, so particular care should be taken regarding this point.

b. Many precision components and the lens are used in the pick-up.
Never attempt to make repairs, or to store parts, where the temperature or humidity is high, where magnetism is strong, or where there is much dust.



(2) Notes regarding repairs



a. Be sure to first disconnect the power plug before attempting to replace any component.

b. All tools, instruments, etc., used for measuring must be grounded.
Grounding can be accomplished by using a conductive metal sheet on the work bench.

c. To prevent AC leakage of the soldering iron, ground its metal part.

d. Repair personnel must be grounded.

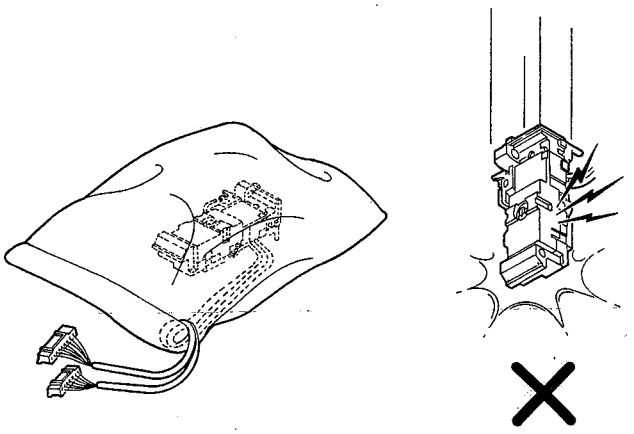
e. Do not look directly at the laser beam coming from the pick-up or allow it to strike against your fingers, skin etc.

HANDLING THE PICK-UP

(1) Shipping and storage cautions

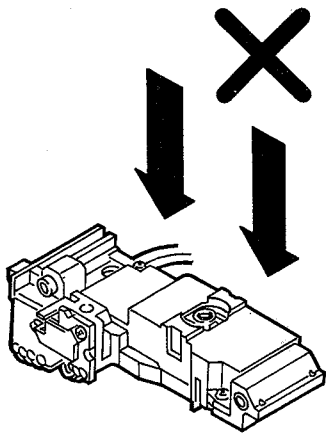
a. The pick-up must be stored in a conductive bag until immediately prior to its use.

b. Do not drop it or subject it to impacts.

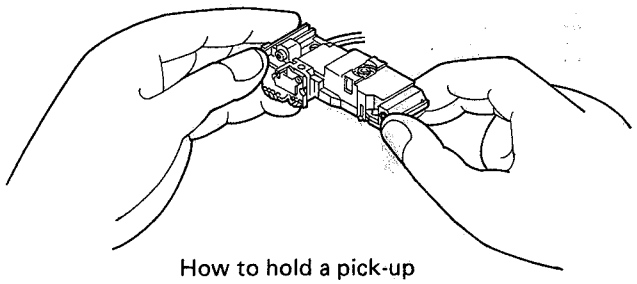


(2) Repair cautions

a. When handling the pick-up, be careful not to give it undue force or shock by your hands. Otherwise the pick-up may malfunction or the PCB may be cracked.

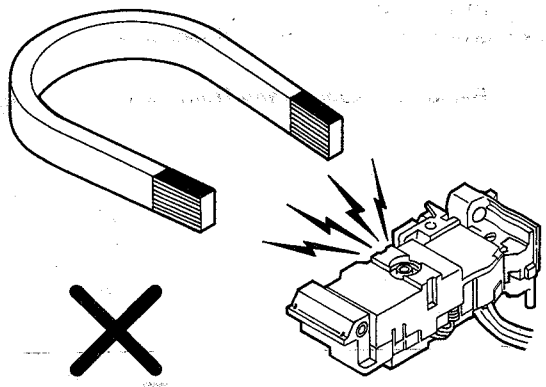


b. **The pick-up which has been minutely adjusted before shipment as one part. Never touch and move the adjusting points and setscrews of the pick-up to avoid damage.**

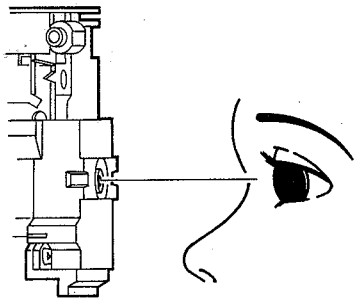


How to hold a pick-up

c. A strong magnet is used in the pick-up.
Do not bring a magnet or other magnetized object near to it.



d. Eyes may be injured if the laser beam enters.
Take great care to be absolutely sure that the laser beam never enters the eyes.
Do not apply power if there is a broken part in the laser output section of the pick-up.

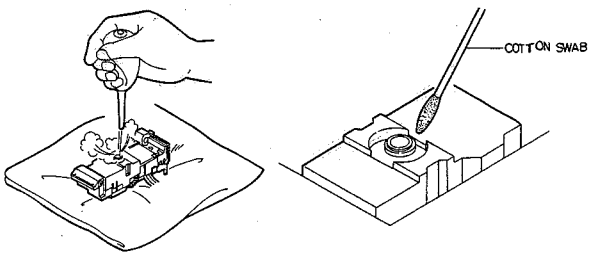


Do not look directly at the laser beam coming from the pick-up or allow it to strike against your fingers, skin, etc.

e. Cleaning the lens

(a) If dust gets on the lens, clean it away by using an air brush such as used for a camera lens.

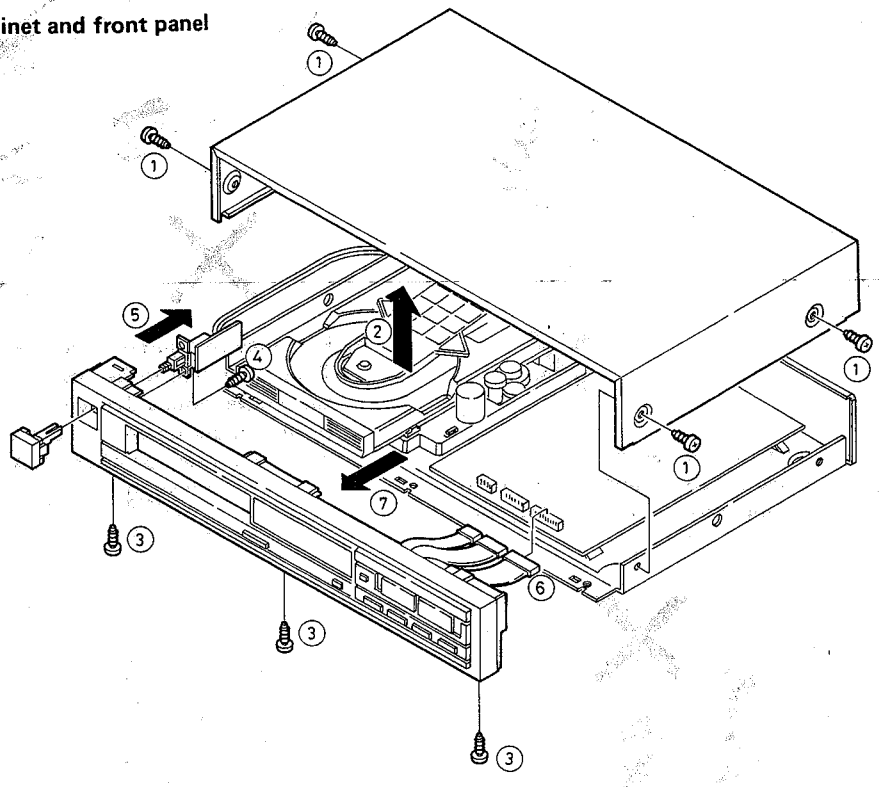
(b) The lens is held in place by a spring.
If the center of the lens is dirty, carefully clean it using cotton swab moistend with **isopropyl-alcohol.** Since special coating is made on the surface of the lens which is made of plastics, do not use other kind of alcohol and cleaning fluid to prevent damage to the lens. Also, be carefull not to bend the lens spring when cleaning.



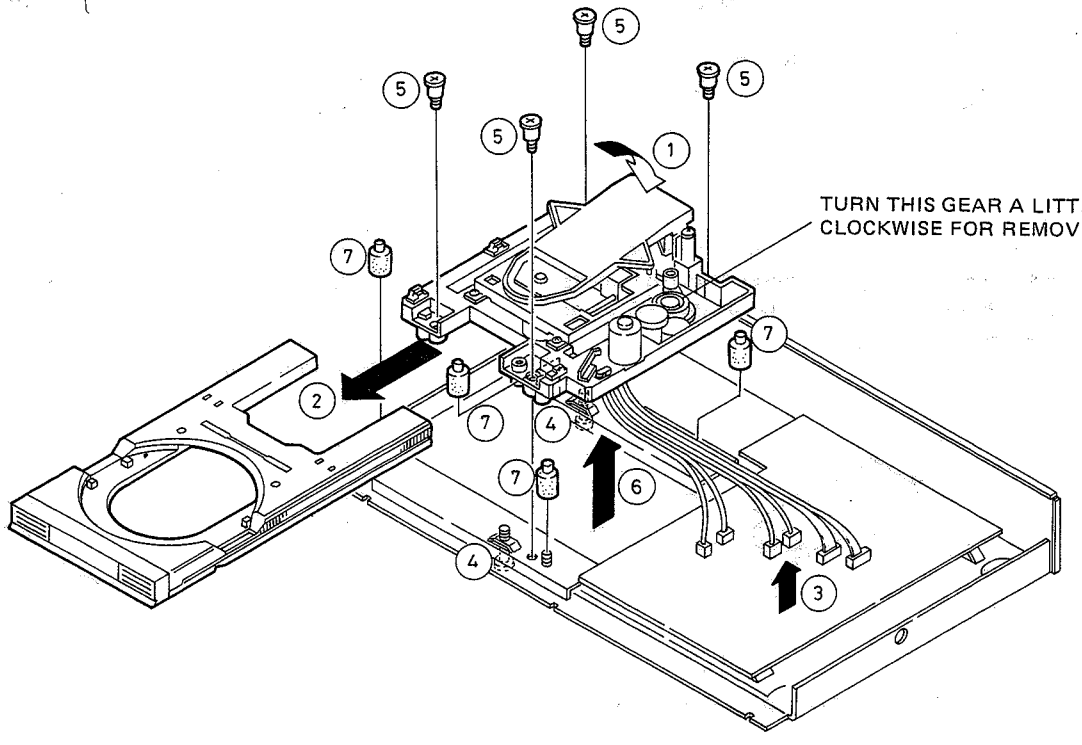
HOW TO DISASSEMBLE THE UNIT

- Remove the compact disc if there should be one on the disc tray.
- Switch the power OFF, and unplug the AC power cord from an AC outlet.
- Disassemble in the numerical sequence.

(1) Removal of cabinet and front panel



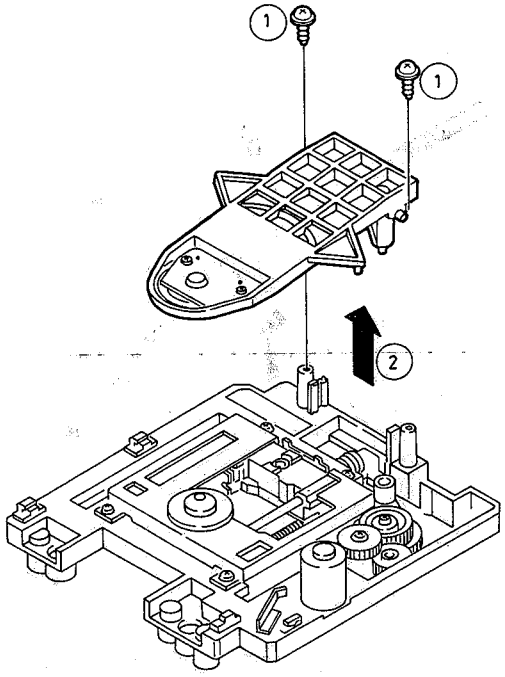
(2) Removal of mechanism and disc tray



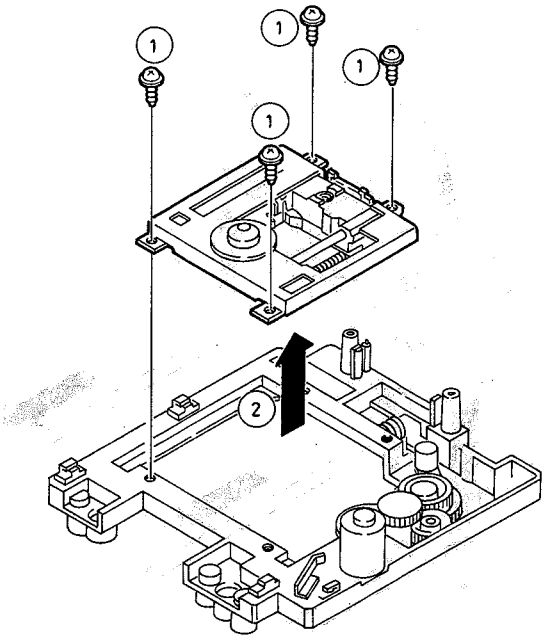
HOW TO DISASSEMBLE THE UNIT

(3) Replacement the pick-up

(a) Removal of disc pressure lever

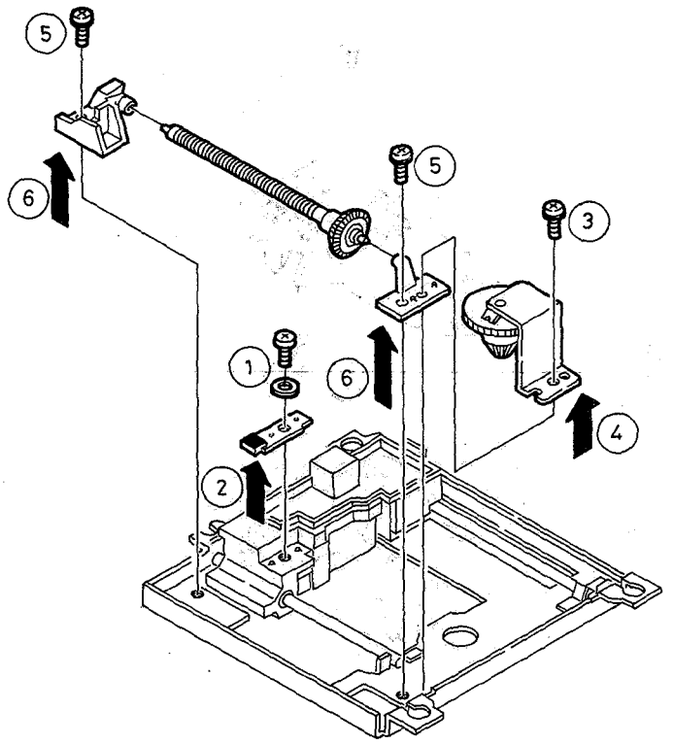


(b) Removal of mechanism chassis

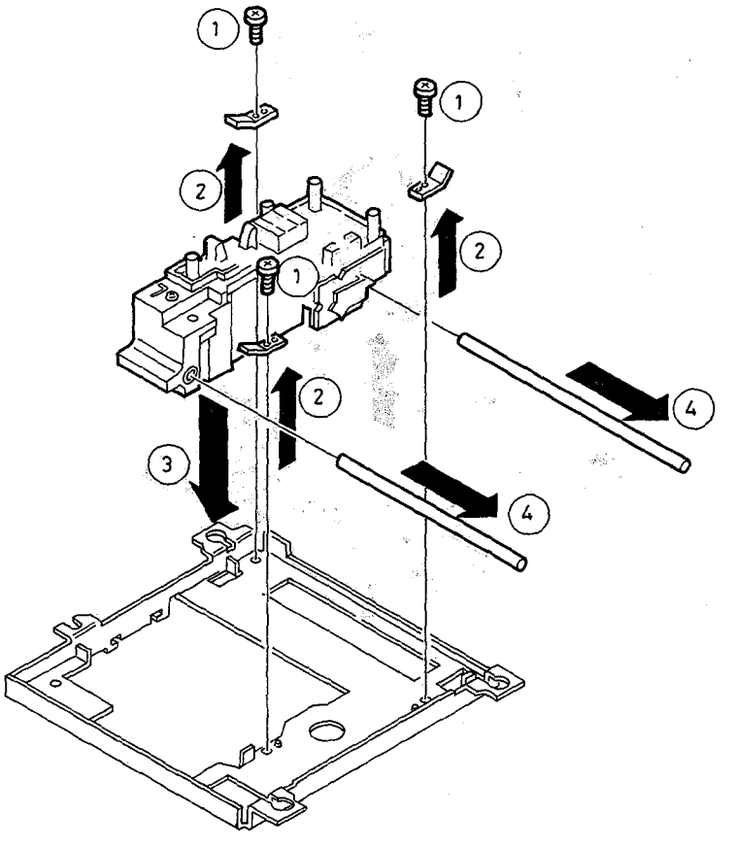


HOW TO DISASSEMBLE THE UNIT

(c) Removal of gears

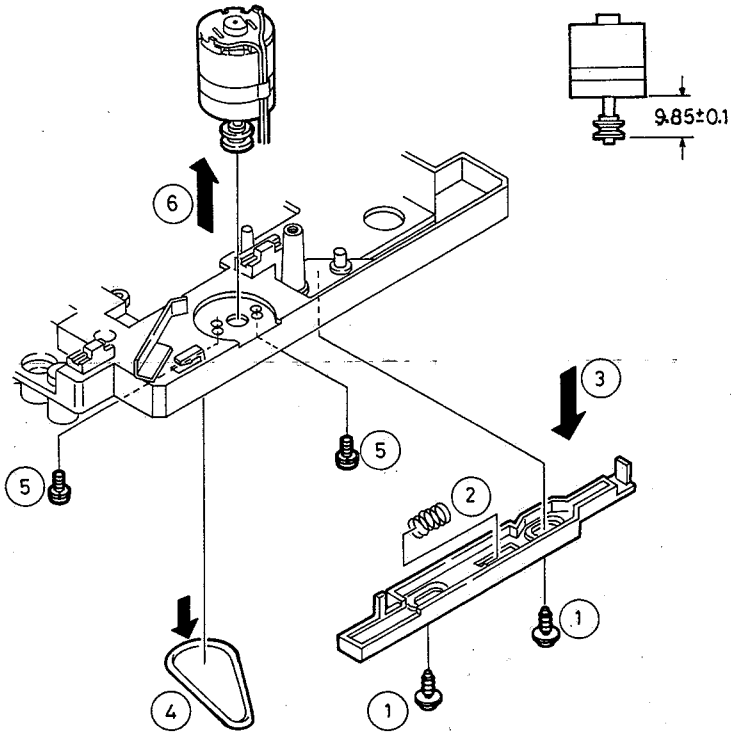


(d) Removal of pick-up

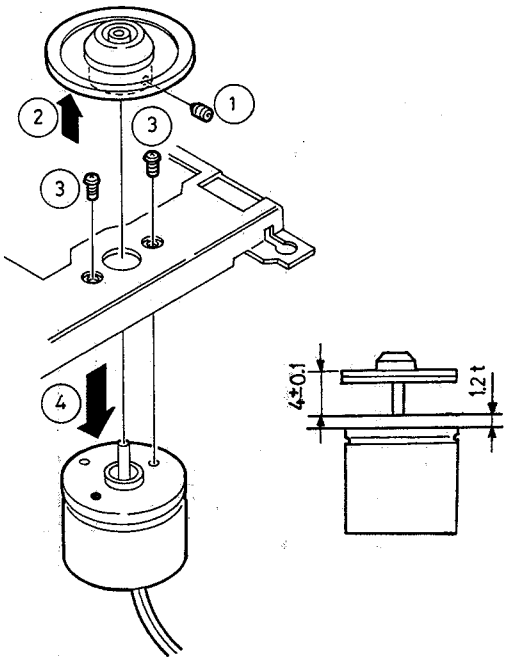


HOW TO DISASSEMBLE THE UNIT

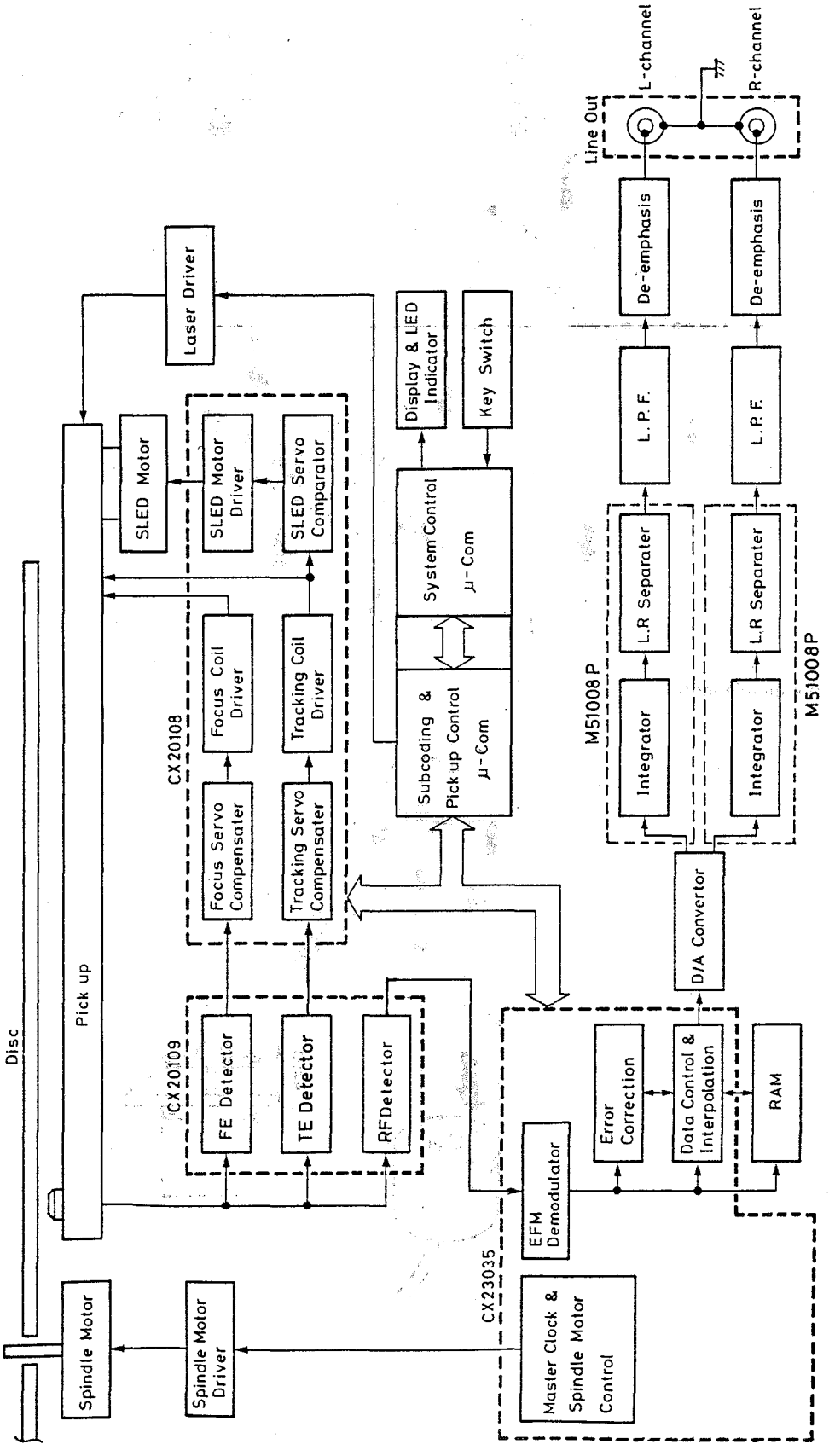
(4) Removal of the loading/sled motor and belt



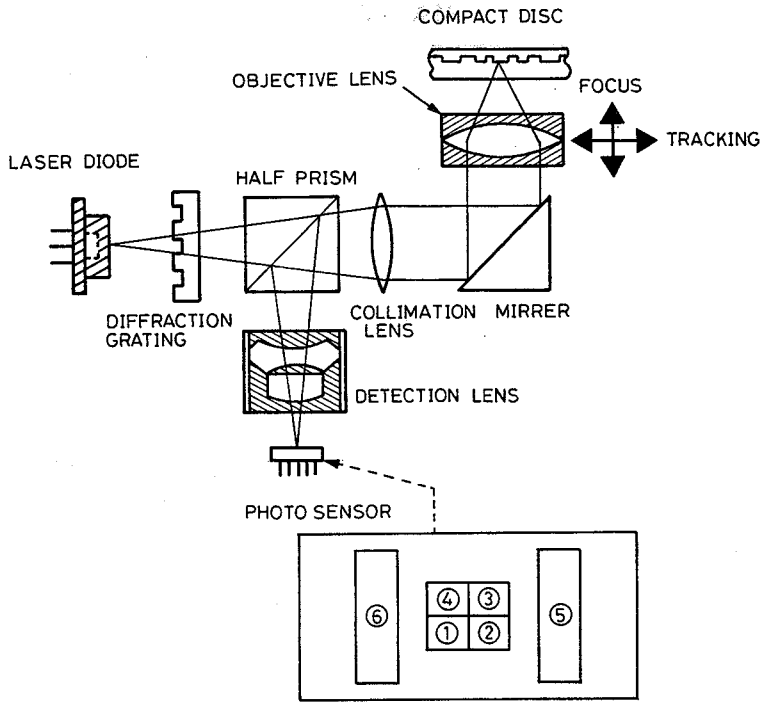
(5) Removal of the spindle motor



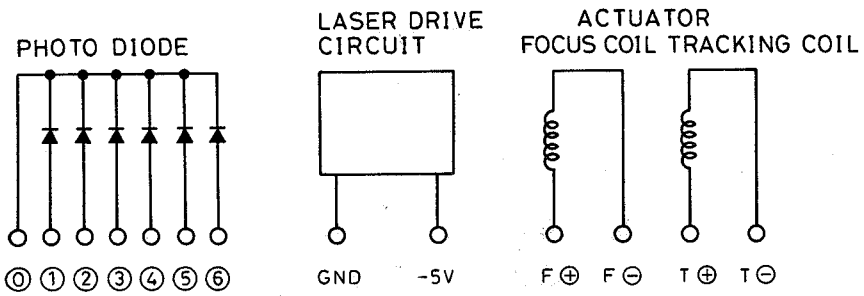
BLOCK DIAGRAM (1)

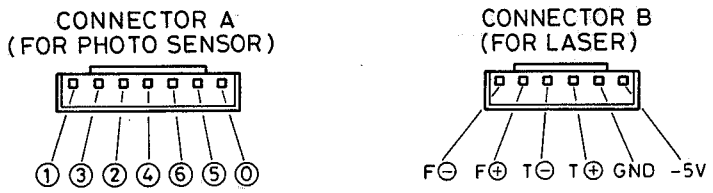


DETAILS OF PICK-UP

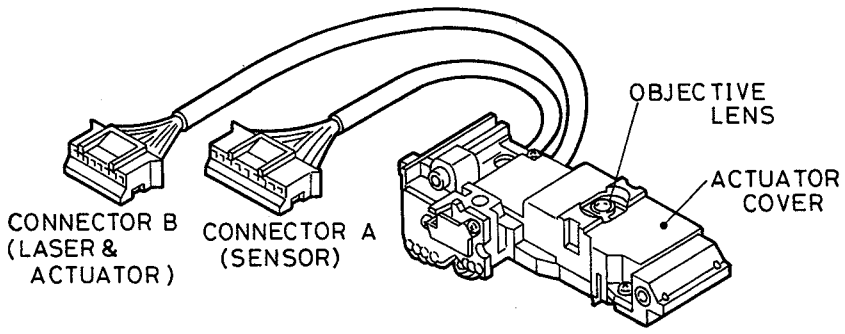


(II). Connection



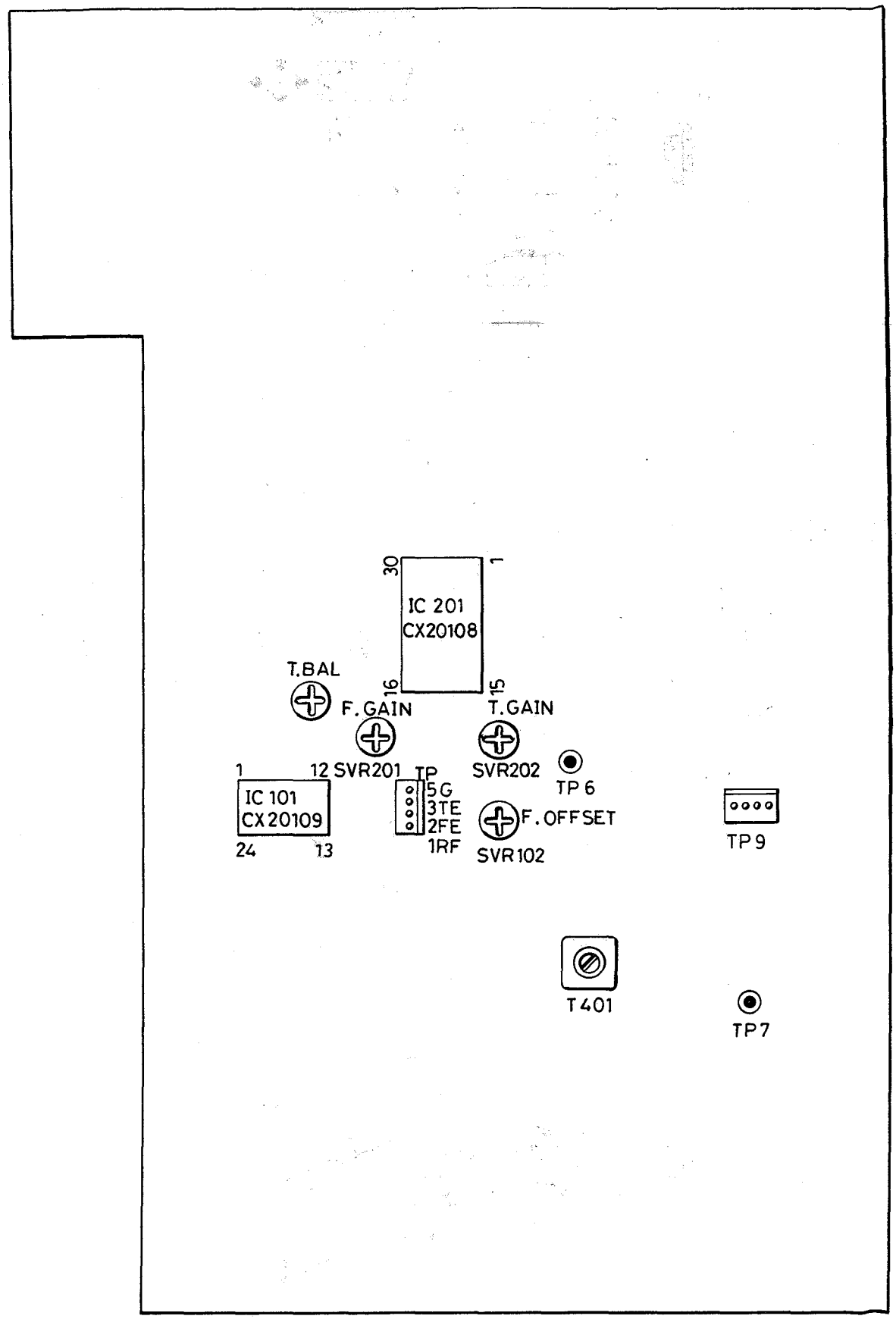


(III). Summary



PARTS LOCATION

MAIN PCB



*T401・SVR101・SVR102・SVR201・SVR202 . . . . . Initial Setting Positions are indicated.

ALIGNMENT

Compact Disc Player Adjustments

So far, we have presented explanations regarding compact disc player handling, notes prior to repair, handling of the pick-up, and disassembly of the unit. Be sure to carefully read these instructions before making any adjustments. The following is an explanation of the order in which adjustments of the compact disc player should be made.

Order	Adjustment
1	PLL-VCO
2	Tracking balance
3	Focus gain
4	Focus offset
5	Tracking gain

Test Discs Requeired for Adjustments and Checks

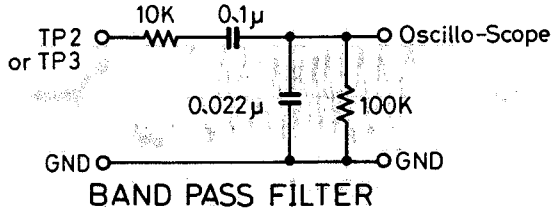
No.	Designation	Description (manufacturer)
1	800104 400088 400067	for demonstruction (Polygram)
2	YEDS7	for signal characteristics test (Sony)
3	Eccentricity disc	eccentricity width: +200 μm
4	Surface oscillation disc	surface oscillation width: +400~500 μm
5	Scratch disc	black scratch width: 300 μm (black line)

NOTES:
1. Test discs are subject to change without notice.
2. The test discs No. 3, No. 4 and No. 5 are used for checking the results of the adjustments.

Measuring Instruments Required for Adjustments

Designation	Model	(manufacturer)
Oscilloscope	SS5711 (100 MHz, 3 phenomena observation)	(Iwasaki Communications)
Storage scope	DSS6521 (memory scope)	(Kikusui Electric)
AC digital voltmeter	Digital tester or digital multi-meter can also be used.	
DC digital voltmeter	Digital tester or digital multi-meter can also be used.	
AF oscillator	Low frequency oscillator	
Band pass filter	See the attached figure.	

NOTES:
1. Adjustments are also possible by using instruments from other manufacturers if the performance corresponds to that described above.
2. Use a probe when using an oscilloscope, storage scope, digital voltmeter to observe the signal. Be sure to connect the probe ground to the indicated ground line.



BAND PASS FILTER

ALIGNMENT

(1) PLL-VCO (Phase Locked Loop Voltage Control Oscillator) Adjustment

Test disc	Measuring instrument	Connection point	Adjustment location	Adjustment value
No. 1	Oscilloscope	TP7 (PLL-LPF output signal)	T401	DC 1.2 ± 0.1V

[Oscilloscope ground: TP5 (S-G)]

(1) Connect the oscilloscope to TP7.
(2) Play the test disc No. 1.
(3) Adjust T401 so that the contracted part of the PLL-LPF signal (the signal from the low pass filter of PLL circuit) waveform on the oscilloscope becomes DC 1.2 ± 0.1V. (See the waveform in Fig. 1)

Note:
If the digital voltmeter is used, adjust the output voltage from TP7 to DC 1.4V.

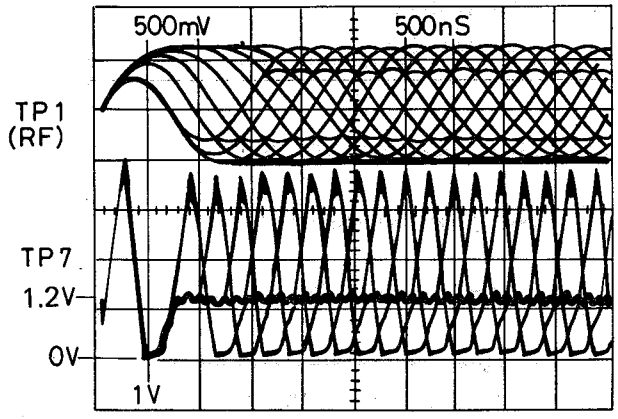


Figure 1

(2) Tracking Balance Adjustment

Test disc	Measuring instrument	Connection point	Adjustment location	Adjustment value
No. 1	Oscilloscope	TP3 (TE signal)	SVR101	Symmetrical waveform See Fig. 2.

[Oscilloscope ground: TP5 (S–G)]

(1) Set SVR101 at its initial set position.
(2) Connect the oscilloscope to TP3 (TE signal).
(3) Play the test disc No. 1.
(4) Have the oscilloscope be triggered with the rising edge of the trick play trigger signal from TP3.
(5) Press the SEARCH button to allow the unit to perform F.FWD or F.BWD operation.
(6) Adjust SVR101 so that the TE (Tracking Error) signal waveform of TP3 on the oscilloscope is vertically symmetrical relative to 0V.

Note:
The initial set positions of the adjustment controls are shown in "Parts Location" on page 13.

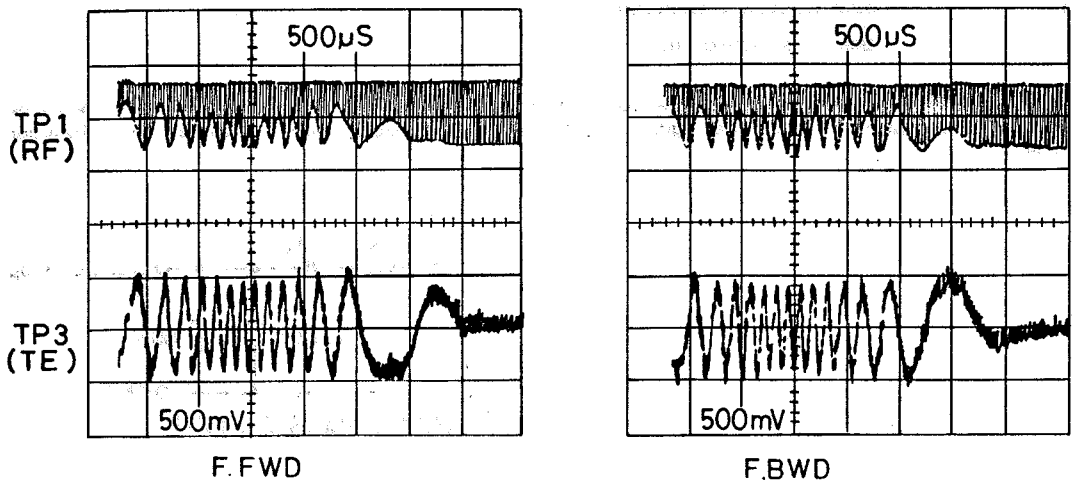


Figure 2

(3) Focus Gain Adjustment

Test disc	Measuring instrument	Connection point	Adjustment location	Adjustment value
No. 1	Storage scope AF oscillator	TP2 (FE signal) Pin (22) of IC201	SVR201	300 mVp-p

[Memory scope ground: TP5 (S–G)]

(1) Set SVR201 at its initial set position (mechanical center position).
(2) Connect the AF oscillator to pin (22) (FE converted signal) of IC201 via a resistor of 150 kohms.
(3) Connect the storage scope (or oscilloscope) to TP2 (FE signal) via a band pass filter.
(4) Play the test disc No. 1.
(5) Set the output of AF oscillator to 400 Hz · 1 Vrms.
(6) Adjust SVR201 so that the maximum output of the FE (Focus Error) signal waveform from TP2 on the oscilloscope is 300 mVp-p.

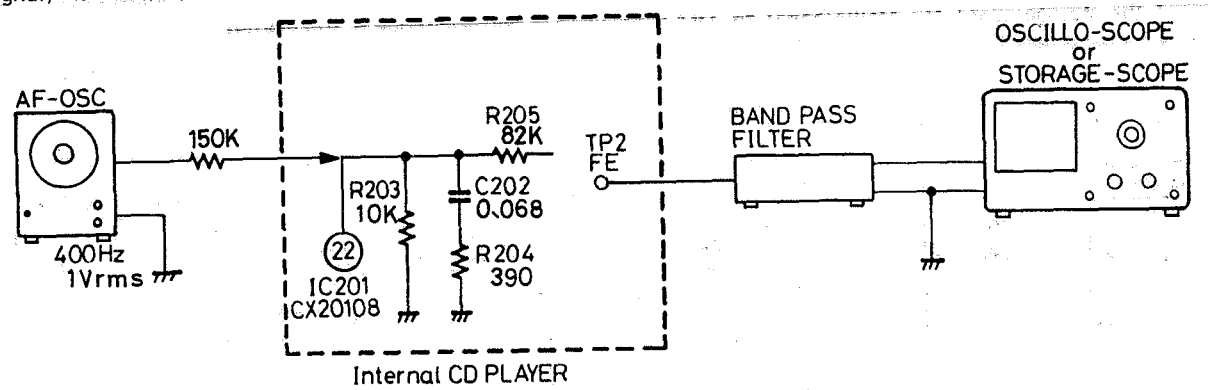


Figure 3

(4) Focus Offset Adjustment

Test disc	Measuring instrument	Connection point	Adjustment location	Adjustment value
No. 1	Oscilloscope	TP2 (FE signal) TP1 (RF signal)	SVR102	The same voltage for PLAY and STOP modes

[Storage scope ground: TP5 (S–G)]

(1) Set SVR102 at its initial set position (mechanical center position).
(2) Connect the oscilloscope to TP2 (FE signal).
(3) Connect the oscilloscope to TP1 (RF signal).
(4) Play the test disc No. 1.
(5) Observe DC offset voltage available at TP2 (Focus Error signal) with the oscilloscope.
(6) Push the STOP button to get the unit in STOP mode.
(7) Adjust SVR102 so that DC offset voltage then available at TP2 is the same as the voltage observed in step 5.
(8) Push the PLAY button to get the unit in PLAY mode again.
(9) Then check that the output waveform from TP1 [Radio Frequency signal (eye pattern)] is as shown in Fig. 4: the part "a" must be straight; the part "b" (eye pattern) must be clear and vivid; and the amplitude of waveform must be maximum.

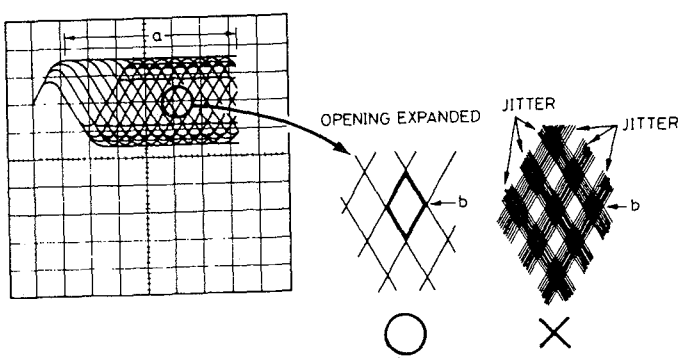


Figure 4

Note:
If the eye pattern "b" in Fig. 4 has a wide opening, this means there is little jitter in the playback sound; if it has a narrow opening, this means there is much jitter in the playback sound.
Meaning of Jitter: Jitter is such penomenon that when a compact disc is played back, the output sound may fluctuate due to the variation of medium.

(5) Tracking Gain Adjustment

Test disc	Measure instrument	Connection point	Adjustment location	Adjustment value
No. 1	Storage scope AF oscillator	TP3 (TE signal) Pin (28) of IC201	SVR202	300 mVp-p

[Storage scope ground: S—G (TP5)]

(1) Set SVR202 at its initial set position.
(2) Connect the AF oscillator to pin (28) of IC201 (the converted signal of the tracking amplifier 2) via a resistor of 270 kohms.
(3) Connect the storage scope (or oscilloscope) to TP3 (TE signal) via a band pass filter.
(4) Play the test disc No. 1.
(5) Set the AF oscillator to 400 Hz • 1 Vrms.
(6) Adjust SVR202 so that the maximum output of the TE (Tracking Error) signal waveform of TP3 on the storage scope is 300 mVp-p.

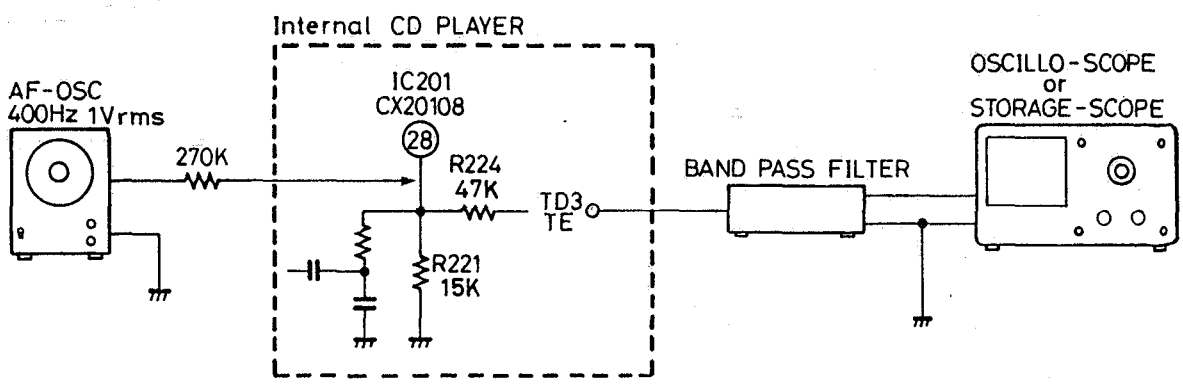
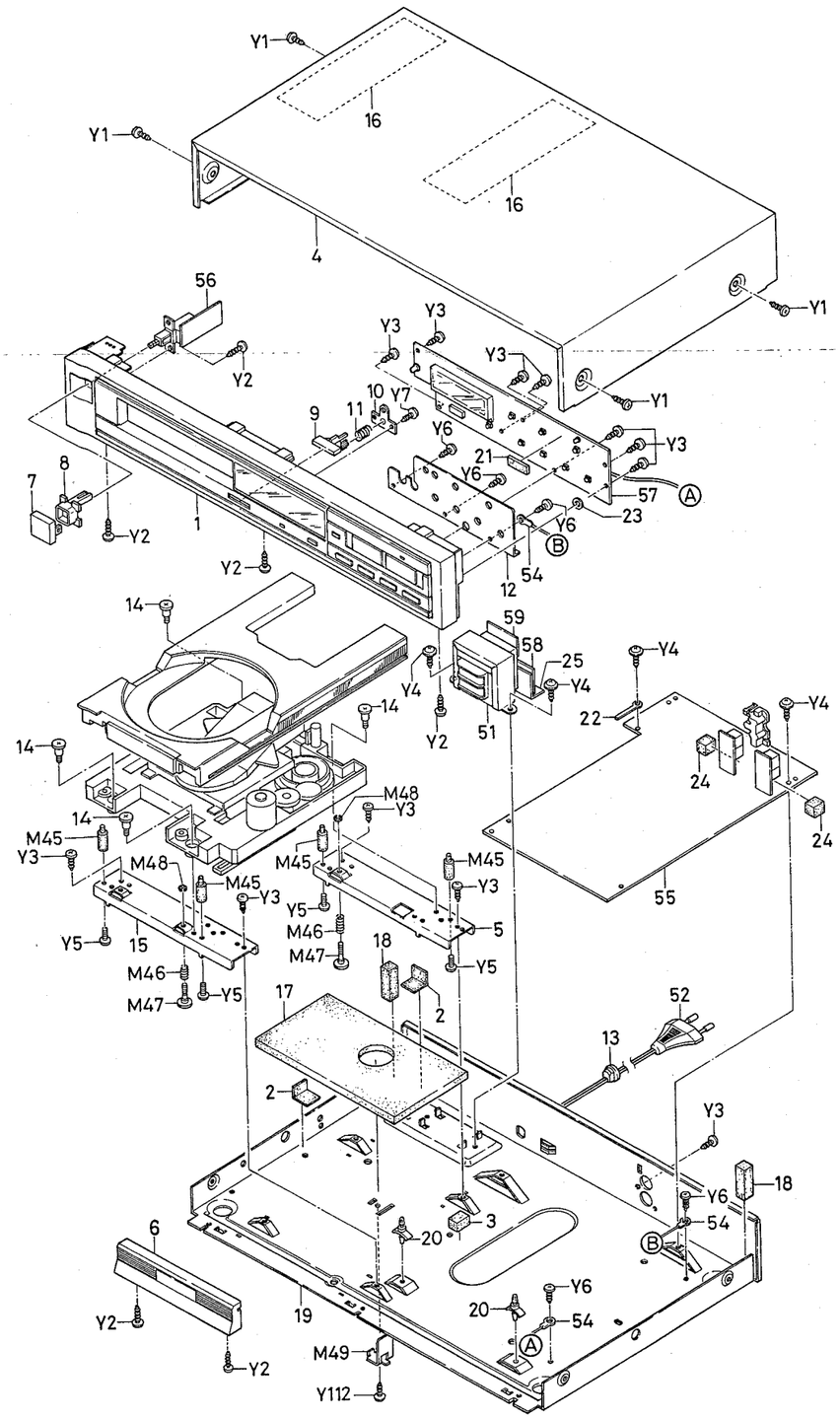


Figure 5

(6) Checking the Adjustments

- **Test disc checks**
  I. Black spot disc ... test disc No. 5 (with +300 μm black scratch)
  There should be no track jumping during play.
  II. Surface oscillation disc ... test disc No. 4 (surface oscillation width +400~+500 μm)
  There should be no track jumping during lead-in to the first, fourth and twelfth tunes.
  III. Eccentricity disc ... test disc No. 3 (eccentricity width +200 μm)
  There should be no track jumping during lead-in.

CABINET & CHASSIS EXPLODED VIEW



Note: The parts identified with Ref. No. M belong to mechanism parts.

PARTS LIST

PRODUCT SAFETY NOTICE

Each precaution in this manual should be followed during servicing. Components identified with the IEC symbol ⚠ in the parts list and the schematic diagram designate components in which safety can be of special significance. When replacing a component identified with ⚠, use only the replacement parts designated, or parts with the same ratings of resistance, wattage or voltage that are designated in the parts list in this manual.
Leakage-current or resistance measurements must be made to determine that exposed parts are acceptably insulated from the supply circuit before returning the product to the customer.

NOTE:

* Materials of Capacitors and Resistors are abbreviated as follows;

AL ELECT	Aluminum Electrolytic
BC CON	Semiconductor Ceramic
CHIP BC	Chip Semiconductor Ceramic
CHIP TAN	Chip Tantal
ELECT	Electrolytic
PP CON	Polypropylene
MT GLAZE	Metal Glaze
FP CARBON	Flameproof Carbon

* Tolerance of Capacitors and Resistors are noted with follow symboles;

J	±5%	P	+100 – 0%
K	±10%	Q	+30 – 10%
M	±20%	Z	+80 – 20%
N	±30%		

PACKING & ACCESSORIES

Ref. No.	Part No.	Description
	141-6-409T-33302	INST MANUAL (EUROPE)
	141-6-409T-33304	INST MANUAL (ITALY)
	141-6-133T-80402	INNER CORR CASE (EUROPE)
	141-6-133T-80404	INNER CORR CASE (ITALY)
	141-6-472T-26300	CAUTION LABEL, MECHANISM SHIPPING
	141-6-472T-26400	CAUTION LABEL, PICK-UP SHIPPING
	141-6-145T-07100	FOAM PLASTIC CASE
	141-6-145T-07000	FOAM PLASTIC CASE
	141-6-231T-25351	INNER POLYE COVER, INST MANUAL
	141-6-235T-40601	INNER POLYE LAMINA COVER, 400X600
	141-6-479T-66000	LABEL, CLASS 1
	141-2-141T-97606	RATING PLATE (ITALY)
	141-2-141T-97604	RATING PLATE (EUROPE)
	141-6-472T-26000	CAUTION LABEL, SHIPPING (BOTTOM LID)
	141-6-472T-26100	CAUTION LABEL, SHIPPING (TOP LID)
	141-6-472T-23100	CAUTION LABEL,
	4-243T-13373	LEAD CORD, RCA-RCA, 1M
	4-243T-37173	LEAD CORD, 950 BLACK

CABINET & CHASSIS

Ref. No.	Part No.	Description
1	141-0-122T-64302	FRONT PANEL ASSY (EUROPE)
	141-0-122T-64304	FRONT PANEL ASSY (ITALY)
2	141-2-447T-46201	CUSHION, 15X25X3
3	141-2-448T-27300	CUSHION, 10X15X10
4	141-2-111T-71000	CABINET
5	141-2-290T-21301	BRACKET, MECHANISM MTG., REAR
6	141-0-154T-13500	ESCUTCHEON ASSY, TRAY (ITALY)
	141-0-154T-13501	ESCUTCHEON ASSY, TRAY (EUROPE)
7	141-2-156T-37900	CUP KNOB, POWER SWITCH
8	141-2-160T-60500	PUSH BUTTON, POWER SWITCH
9	141-2-160T-77100	PUSH BUTTON, OPEN/CLOSE (ITALY)
9	141-2-160T-77101	PUSH BUTTON, OPEN/CLOSE (EUROPE)
10	141-2-210T-79900	BRACKET, OPEN/CLOSE BUTTON
11	141-2-856T-63600	SPRINT COIL, OPEN/CLOSE BUTTON
12	141-2-322T-92600	SHIELD PLATE, DISPLAY PCB
13	141-2-464T-14400	FIXER, AC POWER CORD
14	141-2-421T-46800	SPECIAL SCREW, MECHANISM MTG.
15	141-2-290T-21300	BRACKET, MECHANISM MTG. FRONT
16	141-2-448T-26601	CUSHION, 47X150X7, CABINET (EUROPE)
17	141-2-448T-26501	CUSHION, BOTTOM LID (EUROPE)
18	141-2-448T-26300	CUSHION (EUROPE)
19	141-0-125T-42501	BOTTOM LID ASSY
20	141-2-464T-46600	FIXER, MAIN PCB MTG
21	141-2-448T-26400	CUSHION, 15X7X5, DISPLAY PCB
22	141-2-472T-01201	LUG
23	141-2-453T-02000	SPECIAL WASHER, FIBER
24	141-2-448T-26200	CUSHION, 10X10X8
25	141-2-136T-03701	COVER, POWER TRANSFORMER
Y1	BJB2S++3+8+ZK	BIND HD 2 TAPPING SCREW 3X8
Y2	BJB2S++310+Z1	BIND HD 2 TAPPING SCREW 3X10
Y3	BJB2S++3+8+Z1	BIND HD 2 TAPPING SCREW 3X8
Y4	BJX6S++3+8+Z1	PAN WASHER HD 2 TAPPING SCREW 3X8
Y5	BJESS++3+8+Z1	BIND HD S TITE SCREW 3X8
Y6	BJB2S++3+6+Z1	BIND HD 2 TAPPING SCREW 3X6
Y7	BJN2S++3+8+Z1	PAN HD 2 TAPPING SCREW 3X8

ELECTRICAL PARTS

Ref. No.	Part No.	Description
50	⚠ 4-180T-00800	PICK UP
51	⚠ 4-320T-18000	POWER TRANSFORMER
52	⚠ 4-243T-84973	AC POWER CORD
54	123-2-472R-00401	LUG
58	⚠ 4-285T-77474	P.C BOARD, P.T.PRIMARY
59	⚠ 4-285T-77574	P.C BOARD, P.T.SECONDARY
	4-240T-83575	SOCKET, 5P, P.T.SECONDARY
IC601	⚠ S11CPF25+++++	IC ICP-F25
IC602	⚠ S11CPF25+++++	IC ICP-F25

PARTS LIST

MAIN PCB ASSY

Ref. No.	Part No.	Description
55	⚠ 141-4-285T-77274	P.C BOARD ASSY, MAIN
	4-240T-50371	SOCKET, LINE OUT
	141-2-382T-18900	TERMINAL
	4-236T-18271	PLUG, LPF
	4-285T-82474	P.C BOARD
T401	4-256T-36200	I.F.T, PLL
T502	4-256T-40200	I.F.T, 1ST LPF
T503	4-256T-40300	I.F.T, 2ND LPF
T504	4-256T-40200	I.F.T, 1ST LPF
T505	4-256T-40300	I.F.T, 2ND LPF
L301	4-253T-15020	FILTER, 100UH
L303	4-253T-12732	FILTER, 1000UH
L401	4-253T-15020	FILTER, 100UH
L501	4-253T-15008	FILTER, 1.0UH
L901	⚠ 4-253T-17200	FILTER, AC LINE
X301	4-266T-01300	CERAMIC RESONATOR, 4.19MHZ
X401	4-266T-01900	CERAMIC RESONATOR, 8.46MHZ
X419	4-266T-01300	CERAMIC RESONATOR, 4.19MHZ
X501	4-225T-05300	CRYSTAL, 35MHZ
or	4-225T-06800	CRYSTAL, 35MHZ
X846	4-266T-01900	CERAMIC RESONATOR, 8.46MHZ
SVR101	4-220T-15186	SEMI-FIXED RESISTOR, 47KB
SVR102	4-220T-15182	SEMI-FIXED RESISTOR, 10KB
SVR201	4-220T-15182	SEMI-FIXED RESISTOR, 10KB
SVR202	4-220T-15182	SEMI-FIXED RESISTOR, 10KB
CN1	4-236T-25175	PLUG, 7P
CN2	4-236T-25174	PLUG, 6P
CN3	4-236T-24472	PLUG, 2P
CN4	4-236T-24472	PLUG, 2P
CN5	4-236T-24475	PLUG, 5P
CN7	4-236T-24472	PLUG, 2P
CN8	4-236T-25176	PLUG, 8P
CN9	4-236T-25179	PLUG, 11P
CN10	4-236T-25180	PLUG, 12P
TP1	4-236T-10271	PLUG
TP2	4-236T-10271	PLUG
TP3	4-236T-10271	PLUG
TP5	4-236T-10271	PLUG
TP7	141-2-382T-21300	TERMINAL
TP9	4-236T-10271	PLUG, 6P
RA301	4-221T-10494	RESISTOR, 100K OHM J X 4
RA302	4-221T-10886	RESISTOR, 22K OHM J X 8
RA303	4-221T-11386	RESISTOR, 22K OHM J X 13
IC101	SICX20109++++	IC CX20109
IC201	SICX20108++++	IC CX20108
IC202	SILA6458D++++	IC LA6458D DIP08
or	SINJM4558D+++	IC NJM4558D DIP08
IC301	SICXP5016H116	IC CXP5016H116 DIP64
IC401	SICX23035++++	IC CX23035
IC402	SICXK5816M15L	IC CXK5816M FIP24
or	SITC5516AF+2+	IC TC5516AF 2
IC403	SILA6082D++++	IC LA6082D DIP8
or	SIM5238P+++++	IC M5238P DIP8
or	SINJM082D++++	IC NJM082D DIP8
IC501	SICX20017++++	IC CX20017 DIP28
or	SICX20152++++	IC CX20152 DIP28
IC502	SIM51008P++++	IC M51008P DIP14
IC503	SIM51008P++++	IC M51008P DIP14
IC504	SILA6458DS+++	IC LA6458DS DIP08
or	SINJM4558DD++	IC NJM4558DD DIP08
Q202	STD400+E+++++	TR 2SD400 E
Q203	STB544+E+++++	TR 2SB544 E
Q204	STD400+E+++++	TR 2SD400 E
Q205	STB544+E+++++	TR 2SB544 E
Q206	STD400+E+++++	TR 2SD400 E
Q207	STB544+E+++++	TR 2SB544 E
Q208	STC1740R++++B	TR 2SC1740 R B SP
or	STC1740S++++B	TR 2SC1740 S B SP
or	STC536+G+++UB	TR 2SC536 G AUD B SP
Q301	STC1740R++++B	TR 2SC1740 R B SP
or	STC1740S++++B	TR 2SC1740 S B SP
or	STC536+G+++UB	TR 2SC536 G AUD B SP
Q303	STB598+F+++++	TR 2SB598 F

Ref. No.	Part No.	Description
Q401	STD400+E+++++	TR 2SD400 E
Q402	STB544+E+++++	TR 2SB544 E
Q501	STD1468S++++1	TR 2SD1468 S SP
Q502	STD1468S++++1	TR 2SD1468 S SP
Q503	STD1468S++++1	TR 2SD1468 S SP
Q504	STD1468S++++1	TR 2SD1468 S SP
Q505	STC1740R++++B	TR 2SC1740 R B SP
or	STC1740S++++B	TR 2SC1740 S B SP
or	STC536+G+++UB	TR 2SC536 G AUD B SP
Q506	STA608+F++++B	TR 2SA608 F B SP
or	STA933+R++++B	TR 2SA933 R B SP
or	STA933+S++++B	TR 2SA933 S B SP
Q507	STA608+F++++B	TR 2SA608 F B SP
or	STA933+R++++B	TR 2SA933 R B SP
or	STA933+S++++B	TR 2SA933 S B SP
Q508	STC1740R++++B	TR 2SC1740 R B SP
or	STC1740S++++B	TR 2SC1740 S B SP
or	STC536+G+++UB	TR 2SC536 G AUD B SP
Q509	STA608+F++++B	TR 2SA608 F B SP
or	STA933+R++++B	TR 2SA933 R B SP
or	STA933+S++++B	TR 2SA933 S B SP
Q510	STC1740R++++B	TR 2SC1740 R B SP
or	STC1740S++++B	TR 2SC1740 S B SP
or	STC536+G+++UB	TR 2SC536 G AUD B SP
Q601	STD612+E+++++	TR 2SD612 E
Q602	STB632+E+++++	TR 2SB632 E
Q603	SF2K212+++F++	FET 2SK212 F
Q604	SF2K212+++F++	FET 2SK212 F
Q605	STA608+F++++B	TR 2SA608 F B SP
or	STA933+R++++B	TR 2SA933 R B SP
or	STA933+S++++B	TR 2SA933 S B SP
Q621	STC1740R++++B	TR 2SC1740 R B SP
or	STC1740S++++B	TR 2SC1740 S B SP
or	STC536+G+++UB	TR 2SC536 G AUD B SP
Q631	STB544+E+++++	TR 2SB544 E
Q632	STA608+F++++B	TR 2SA608 F B SP
or	STA933+R++++B	TR 2SA933 R B SP
or	STA933+S++++B	TR 2SA933 S B SP
D201	SDGZA036Y++++	ZENER DIODE GZA3.6Y
D301	SDGMA01+++++T	DIODE GMA01
or	SD1SS133++++T	DIODE 1SS133
D302	SDGMA01+++++T	DIODE GMA01
or	SD1SS133++++T	DIODE 1SS133
D304	SDGMA01+++++T	DIODE GMA01
or	SD1SS133++++T	DIODE 1SS133
D401	SCKV1236Z2+++	VARACTOR DIODE KV1236 Z2
D402	SDGMA01+++++T	DIODE GMA01
or	SD1SS133++++T	DIODE 1SS133
D403	SDGMA01+++++T	DIODE GMA01
or	SD1SS133++++T	DIODE 1SS133
D404	SDGMA01+++++T	DIODE GMA01
or	SD1SS133++++T	DIODE 1SS133
D551	SDGMA01+++++T	DIODE GMA01
or	SD1SS133++++T	DIODE 1SS133
D552	SDGMA01+++++T	DIODE GMA01
or	SD1SS133++++T	DIODE 1SS133
D553	SDGMA01+++++T	DIODE GMA01
or	SD1SS133++++T	DIODE 1SS133
D554	SDGMA01+++++T	DIODE GMA01
or	SD1SS133++++T	DIODE 1SS133
D555	SDGZS068Y+++T	ZENER DIODE GZS6.8Y T
or	SDMTZ068B+++T	ZENER DIODE MTZ6.8B
D601	⚠ SDDSF10+C+++T	DIODE DSF10 C T
or	⚠ SD1SR35+2H++T	DIODE 1SR35-200A
D602	⚠ SDDSF10+C+++T	DIODE DSF10 C T
or	⚠ SD1SR35+2H++T	DIODE 1SR35-200A
D603	⚠ SDDSF10+C+++T	DIODE DSF10 C T
or	⚠ SD1SR35+2H++T	DIODE 1SR35-200A
D604	⚠ SDDSF10+C+++T	DIODE DSF10 C T
or	⚠ SD1SR35+2H++T	DIODE 1SR35-200A
D605	SDGZS056Y+++T	ZENER DIODE GZS5.6Y T
or	SDMTZ056B+++T	ZENER DIODE MTZ5.6B
D606	⚠ SDGZS056Y+++T	ZENER DIODE GZS5.6Y T
or	⚠ SDMTZ056B+++T	ZENER DIODE MTZ5.6B

PARTS LIST

Ref. No.	Part No.	Description
D607	⚠ SDDSF10+C+++T	DIODE DSF10 C T
or	⚠ SD1SR35+2H++T	DIODE 1SR35-200A
D608	SDDSF10+C+++T	DIODE DSF10 C T
or	SD1SR35+2H++T	DIODE 1SR35-200A
D609	⚠ SDDSF10+C+++T	DIODE DSF10 C T
or	⚠ SD1SR35+2H++T	DIODE 1SR35-200A
D610	SDGZS180Y+++T	ZENER DIODE GZS18Y T
or	SDMTZ180B+++T	ZENER DIODE MTZ18.0B
D611	⚠ SDGZS047Y+++T	ZENER DIODE GZS4.7Y T
or	⚠ SDMTZ047B+++T	ZENER DIODE MTZ4.7B
D621	SDGMA01+++++T	DIODE GMA01
or	SD1SS133++++T	DIODE 1SS133
D622	SDGMA01+++++T	DIODE GMA01
or	SD1SS133++++T	DIODE 1SS133
D624	SDDSF10+C+++T	DIODE DSF10 C T
or	SD1SR35+2H++T	DIODE 1SR35-200A
C102	CM+50333KR++F	MYLAR 0.033MF 50V K R
C103	CC+50151JRSLF	CERAMIC 150PF 50V J R SL F
C104	CC+50151JRSLF	CERAMIC 150PF 50V J R SL F
C105	CC+50151JRSLF	CERAMIC 150PF 50V J R SL F
C106	CC+50151JRSLF	CERAMIC 150PF 50V J R SL F
C107	CM+50103KR++F	MYLAR 0.01MF 50V K R
C108	CE+50474MR++F	ELECT 0.47MF 50V M R
C109	CE+16336MR++F	ELECT 33MF 16V M R
C110	CE+16336MR++F	ELECT 33MF 16V M R
C111	CE+16106MY++S	ELECT 10MF 16V M Y
C112	CC+50103ZRZFF	CERAMIC 0.01MF 50V Z R ZF
C201	CF+50104JM++S	METAL POLY 0.1MF 50V J M
C202	CB+25683KRXRF	BC CON 0.068MF 25V K R XR
C203	CB+25683KRXRF	BC CON 0.068MF 25V K R XR
C204	CB+25472KRXRF	BC CON 0.0047MF 25V K R XR
C205	CB+25682KRXRF	BC CON 0.0068MF 25V K R XR
C206	CB+25152KRXRF	BC CON 0.0015MF 25V K R XR
C207	CF+50334JM++S	METAL POLY 0.33MF 50V J M
C208	CB+25682KRXRF	BC CON 0.0068MF 25V K R XR
C209	CB+25682KRXRF	BC CON 0.0068MF 25V K R XR
C210	CB+25153KDXRS	BC CON 0.015MF 25V K D XR
C211	CF+50104JR++F	METAL POLY 0.1MF 50V J R
C212	CE+25475MR++F	ELECT 4.7MF 25V M R
C213	CB+25332KRXRF	BC CON 0.0033MF 25V K R XR
C214	CC+50102KRYBF	CERAMIC 0.001MF 50V K R YB
C215	CF+50224JM++S	METAL POLY 0.22MF 50V J M
C216	CE+16336MR++F	ELECT 33MF 16V M R
C217	CE+16336MR++F	ELECT 33MF 16V M R
C218	CE+16106MR++F	ELECT 10MF 16V M R
C219	CE+25475MY++S	ELECT 4.7MF 25V M Y
C220	CC+50101KDSLS	CERAMIC 100PF 50V K D SL
C221	CC+50821KDYBS	CERAMIC 820PF 50V K D YB
C301	CE+10107MR++F	ELECT 100MF 10V M R
C302	CC+50330JRSLF	CERAMIC 33PF 50V J R SL
C303	CC+50330JRSLF	CERAMIC 33PF 50V J R SL
C305	CE6R3108MY++S	ELECT 1000MF 6.3V M Y
C306	CC+50103ZDZFS	CERAMIC 0.01MF 50V Z D ZF
C311	CC+50101KDSLS	CERAMIC 100PF 50V K D SL
C312	CC+50101KDSLS	CERAMIC 100PF 50V K D SL
C313	CC+50101KDSLS	CERAMIC 100PF 50V K D SL
C314	CC+50101KDSLS	CERAMIC 100PF 50V K D SL
C401	CC+50390JDCHS	CERAMIC 39PF 50V J D CH NPO
C402	CC+50390JDCHS	CERAMIC 39PF 50V J D CH NPO
C403	CF+50104JR++F	METAL POLY 0.1MF 50V J R
C404	CC+50222KRYBF	CERAMIC 0.0022MF 50V K RYB
C405	CC+50222KRYBF	CERAMIC 0.0022MF 50V K RYB
C406	CC+50330JDCHS	CERAMIC 33PF 50V J D CH NPO
C407	CC+50221JDCHS	CERAMIC 220PF 50V J D CH
C408	CC+50330JDCHS	CERAMIC 33PF 50V J D CH NPO
C409	CE+25475MR++F	ELECT 4.7MF 25V M R
C410	CE+50105MY++S	ELECT 1MF 50V M Y
C411	CB+25223KRXRF	BC CON 0.022MF 25V K R XR
C412	CB+25333KRXRF	BC CON 0.033MF 25V K R XR
C413	CC+50821KRYBF	CERAMIC 820PF 50V K R YB
C414	CF+50224JM++S	METAL POLY 0.22MF 50V J M
C415	CC+50102KRYBF	CERAMIC 0.001MF 50V K R YB
C416	CC+50103ZRZFF	CERAMIC 0.01MF 50V Z R ZF

Ref. No.	Part No.	Description
C417	CC+50103ZRZFF	CERAMIC 0.01MF 50V Z R ZF
C418	CE+16336MR++F	ELECT 33MF 16V M R
C419	CC+50103ZRZFF	CERAMIC 0.01MF 50V Z R ZF
C420	CC+50103ZRZFF	CERAMIC 0.01MF 50V Z R ZF
C421	CE+50105MY++S	ELECT 1MF 50V M Y
C500	CC+50103ZDZFS	CERAMIC 0.01MF 50V Z D ZF
C501	CC+50470KRSLF	CERAMIC 47PF 50V K R SL
C502	CC+50470KRSLF	CERAMIC 47PF 50V K R SL
C503	CC+50102KRYBF	CERAMIC 0.001MF 50V K R YB
C504	CC+50180JRSLF	CERAMIC 18PF 50V J R SL
C505	CE+16336MR++F	ELECT 33MF 16V M R
C506	CE+50105MR++F	ELECT 1MF 50V M R
C507	CE+16336MR++F	ELECT 33MF 16V M R
C508	CC+50473ZRZFF	CERAMIC 0.047MF 50V Z R ZF
C509	CE+10227MY++S	ELECT 220MF 10V M Y
C510	CE+16336MR++F	ELECT 33MF 16V M R
C511	CE+16336MR++F	ELECT 33MF 16V M R
C512	CE+16336MR++F	ELECT 33MF 16V M R
C513	CN100152JR++F	P P CON 1500PF 100V J R
C514	CN100152JR++F	P P CON 1500PF 100V J R
C515	CC+50560KRSLF	CERAMIC 56PF 50V K R SL
C516	CC+50560KRSLF	CERAMIC 56PF 50V K R SL
C517	CC+50103ZRZFF	CERAMIC 0.01MF 50V Z R ZF
C518	CC+50103ZRZFF	CERAMIC 0.01MF 50V Z R ZF
C519	CE+16336MR++F	ELECT 33MF 16V M R
C520	CE+16336MR++F	ELECT 33MF 16V M R
C523	CM+50683KM++S	MYLAR 0.068MF 50V K M
C524	CM+50683KM++S	MYLAR 0.068MF 50V K M
C525	CE+25475MR++F	ELECT 4.7MF 25V M R
C526	CE+25475MR++F	ELECT 4.7MF 25V M R
C527	CM+50102KR++F	MYLAR 0.001MF 50V K R
C528	CM+50102KR++F	MYLAR 0.001MF 50V K R
C529	CC+50473ZRZFF	CERAMIC 0.047MF 50V Z R ZF
C531	CC+50221JRSLF	CERAMIC 220PF 50V J R SL
C532	CC+50221JRSLF	CERAMIC 220PF 50V J R SL
C533	CN100821JR++F	P P CON 820PF 100V J R
C534	CN100821JR++F	P P CON 820PF 100V J R
C552	CE+10107MR++F	ELECT 100MF 10V M R
C553	CE+16106MR++F	ELECT 10MF 16V M R
C554	CE+16106MR++F	ELECT 10MF 16V M R
C601	⚠ CC+50103ZRZFF	CERAMIC 0.01MF 50V Z R ZF
C602	⚠ CC+50103ZRZFF	CERAMIC 0.01MF 50V Z R ZF
C605	⚠ CE+16338MY++S	ELECT 3300MF 16V M Y
C606	⚠ CE+16338MY++S	ELECT 3300MF 16V M Y
C607	CE+10476MR++F	ELECT 47MF 10V M R
C608	CE+10476MR++F	ELECT 47MF 10V M R
C609	CE+10107MR++F	ELECT 100MF 10V M R
C610	CE+10107MR++F	ELECT 100MF 10V M R
C616	⚠ CE+25476MY++S	ELECT 47MF 25V M Y
C617	⚠ CE+25476MR++F	ELECT 47MF 25V M R
C618	⚠ CE+16476MR++F	ELECT 47MF 16V M R
C619	CE+25476MR++F	ELECT 47MF 25V M R
C620	⚠ CE+50105MR++F	ELECT 1MF 50V M R
C621	CE+25475MR++F	ELECT 4.7MF 25V M R
C622	CE+50225MR++F	ELECT 2.2MF 50V M R
C623	CE+10476MY++S	ELECT 47MF 10V M Y
C624	CB+25104MDXRS	BC CON 0.1MF 25V M D XR
R101	RC/+6153JT+++	CARBON T 15K OHM J 1/6W
R104	RC/+6222JT+++	CARBON T 2.2K OHM J 1/6W
R105	RC/+6474JT+++	CARBON T 470K OHM J 1/6W
R106	RC/+6683JT+++	CARBON T 68K OHM J 1/6W
R107	RC/+6473JT+++	CARBON T 47K OHM J 1/6W
R108	RC/+6333JT+++	CARBON T 33K OHM J 1/6W
R109	RC/+6333JT+++	CARBON T 33K OHM J 1/6W
R110	RC/+6334JT+++	CARBON T 330K OHM J 1/6W
R111	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R112	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R113	RC/+6472JT+++	CARBON T 4.7K OHM J 1/6W
R114	RC/+6102JT+++	CARBON T 1K OHM J 1/6W
R115	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R116	RC/+6122JT+++	CARBON T 1.2K OHM J 1/6W
R117	RC/+6122JT+++	CARBON T 1.2K OHM J 1/6W
R118	RC/+6332JT+++	CARBON T 3.3K OHM J 1/6W
R201	RC/+6333JT+++	CARBON T 33K OHM J 1/6W

PARTS LIST

Ref. No.	Part No.	Description
R202	RC/+6333JT+++	CARBON T 33K OHM J 1/6W
R203	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R204	RC/+6391JT+++	CARBON T 390 OHM J 1/6W
R205	RC/+6823JT+++	CARBON T 82K OHM J 1/6W
R206	RC/+6823JT+++	CARBON T 82K OHM J 1/6W
R207	RC/+6271JT+++	CARBON T 270 OHM J 1/6W
R209	RF/+44R7JSRFR	FUSE RESISTOR S 4.7 OHM J 1/4W R25
R210	RF/+44R7JSRFR	FUSE RESISTOR S 4.7 OHM J 1/4W R25
R213	RC/+6333JT+++	CARBON T 33K OHM J 1/6W
R214	RC/+6223JT+++	CARBON T 22K OHM J 1/6W
R215	RC/+6562JT+++	CARBON T 5.6K OHM J 1/6W
R216	RC/+6683JT+++	CARBON T 68K OHM J 1/6W
R217	RC/+6473JT+++	CARBON T 47K OHM J 1/6W
R218	RC/+6104JT+++	CARBON T 100K OHM J 1/6W
R219	RC/+6472JT+++	CARBON T 4.7K OHM J 1/6W
R220	RC/+6153JT+++	CARBON T 15K OHM J 1/6W
R221	RC/+6153JT+++	CARBON T 15K OHM J 1/6W
R222	RC/+6272JT+++	CARBON T 2.7K OHM J 1/6W
R223	RC/+6105JT+++	CARBON T 1M OHM J 1/6W
R224	RC/+6473JT+++	CARBON T 47K OHM J 1/6W
R225	RC/+6271JT+++	CARBON T 270 OHM J 1/6W
R228	RC/+6823JT+++	CARBON T 82K OHM J 1/6W
R229	RC/+6333JT+++	CARBON T 33K OHM J 1/6W
R230	RC/+6273JT+++	CARBON T 27K OHM J 1/6W
R231	RC/+6124JT+++	CARBON T 120K OHM J 1/6W
R232	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R233	RC/+6473JT+++	CARBON T 47K OHM J 1/6W
R234	RC/+6333JT+++	CARBON T 33K OHM J 1/6W
R235	RC/+6271JT+++	CARBON T 270 OHM J 1/6W
R236	RC/+6683JT+++	CARBON T 68K OHM J 1/6W
R237	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R238	RF/+44R7JSRFR	FUSE RESISTOR S 4.7 OHM J 1/4W R25
R239	RF/+44R7JSRFR	FUSE RESISTOR S 4.7 OHM J 1/4W R25
R240	RC/+64R7JT+++	CARBON T 4.7 OHM J 1/6W
R241	RC/+6124JT+++	CARBON T 120K OHM J 1/6W
R242	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R243	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R301	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R302	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R304	RC/+6333JT+++	CARBON T 33K OHM J 1/6W
R305	RC/+6102JT+++	CARBON T 1K OHM J 1/6W
R308	RC/+6333JT+++	CARBON T 33K OHM J 1/6W
R309	RC/+6104JT+++	CARBON T 100K OHM J 1/6W
R310	RC/+6104JT+++	CARBON T 100K OHM J 1/6W
R351	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R352	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R401	RC/+6472JT+++	CARBON T 4.7K OHM J 1/6W
R402	RC/+6272JT+++	CARBON T 2.7K OHM J 1/6W
R403	RC/+6105JT+++	CARBON T 1M OHM J 1/6W
R404	RC/+6105JT+++	CARBON T 1M OHM J 1/6W
R405	RC/+6123JT+++	CARBON T 12K OHM J 1/6W
R406	RC/+6822JT+++	CARBON T 8.2K OHM J 1/6W
R407	RC/+6153JT+++	CARBON T 15K OHM J 1/6W
R408	RC/+6102JT+++	CARBON T 1K OHM J 1/6W
R409	RC/+6153JT+++	CARBON T 15K OHM J 1/6W
R410	RC/+6104JT+++	CARBON T 100K OHM J 1/6W
R411	RC/+6104JT+++	CARBON T 100K OHM J 1/6W
R412	RC/+6392JT+++	CARBON T 3.9K OHM J 1/6W
R414	RC/+6104JT+++	CARBON T 100K OHM J 1/6W
R415	RC/+6334JT+++	CARBON T 330K OHM J 1/6W
R416	RC/+6334JT+++	CARBON T 330K OHM J 1/6W
R417	RC/+6822JT+++	CARBON T 8.2K OHM J 1/6W
R418	RC/+6223JT+++	CARBON T 22K OHM J 1/6W
R419	RC/+6564JT+++	CARBON T 560K OHM J 1/6W
R420	RC/+6393JT+++	CARBON T 39K OHM J 1/6W
R421	RC/+6684JT+++	CARBON T 680K OHM J 1/6W
R422	RC/+6153JT+++	CARBON T 15K OHM J 1/6W
R423	RC/+6183JT+++	CARBON T 18K OHM J 1/6W
R424	RC/+6183JT+++	CARBON T 18K OHM J 1/6W

Ref. No.	Part No.	Description
R425	RC/+6271JT+++	CARBON T 270 OHM J 1/6W
R426	RC/+64R7JT+++	CARBON T 4.7 OHM J 1/6W
R427	RF/+44R7JSRFR	FUSE RESISTOR S 4.7 OHM J 1/4W R25
R428	RF/+44R7JSRFR	FUSE RESISTOR S 4.7 OHM J 1/4W R25
R429	RC/+6102JT+++	CARBON T 1K OHM J 1/6W
R430	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R431	RC/+6105JT+++	CARBON T 1M OHM J 1/6W
R501	RC/+6101JT+++	CARBON T 100 OHM J 1/6W
R502	RC/+6563JT+++	CARBON T 56K OHM J 1/6W
R503	RC/+6681JT+++	CARBON T 680 OHM J 1/6W
R504	RC/+6472JT+++	CARBON T 4.7K OHM J 1/6W
R505	RC/+6472JT+++	CARBON T 4.7K OHM J 1/6W
R511	RC/+6822JT+++	CARBON T 8.2K OHM J 1/6W
R512	RC/+6822JT+++	CARBON T 8.2K OHM J 1/6W
R513	RC/+6123JT+++	CARBON T 12K OHM J 1/6W
R514	RC/+6123JT+++	CARBON T 12K OHM J 1/6W
R515	RC/+6153JT+++	CARBON T 15K OHM J 1/6W
R516	RC/+6153JT+++	CARBON T 15K OHM J 1/6W
R517	RC/+6183JT+++	CARBON T 18K OHM J 1/6W
R518	RC/+6183JT+++	CARBON T 18K OHM J 1/6W
R519	RC/+6472JT+++	CARBON T 4.7K OHM J 1/6W
R520	RC/+6472JT+++	CARBON T 4.7K OHM J 1/6W
R521	RC/+6332JT+++	CARBON T 3.3K OHM J 1/6W
R522	RC/+6332JT+++	CARBON T 3.3K OHM J 1/6W
R523	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R524	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R525	RC/+6333JT+++	CARBON T 33K OHM J 1/6W
R526	RC/+6333JT+++	CARBON T 33K OHM J 1/6W
R527	RC/+6561JT+++	CARBON T 560 OHM J 1/6W
R528	RC/+6561JT+++	CARBON T 560 OHM J 1/6W
R529	RC/+6221JT+++	CARBON T 220 OHM J 1/6W
R530	RC/+6221JT+++	CARBON T 220 OHM J 1/6W
R531	RC/+6474JT+++	CARBON T 470K OHM J 1/6W
R532	RC/+6474JT+++	CARBON T 470K OHM J 1/6W
R533	RC/+6472JT+++	CARBON T 4.7K OHM J 1/6W
R534	RC/+6472JT+++	CARBON T 4.7K OHM J 1/6W
R535	RC/+6104JT+++	CARBON T 100K OHM J 1/6W
R536	RC/+6104JT+++	CARBON T 100K OHM J 1/6W
R537	RC/+6471JT+++	CARBON T 470 OHM J 1/6W
R538	RC/+6471JT+++	CARBON T 470 OHM J 1/6W
R539	RC/+6472JT+++	CARBON T 4.7K OHM J 1/6W
R540	RC/+6472JT+++	CARBON T 4.7K OHM J 1/6W
R541	RC/+6123JT+++	CARBON T 12K OHM J 1/6W
R542	RC/+6123JT+++	CARBON T 12K OHM J 1/6W
R551	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R552	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R553	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R554	RC/+6104JT+++	CARBON T 100K OHM J 1/6W
R555	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R556	RC/+6102JT+++	CARBON T 1K OHM J 1/6W
R557	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R558	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R559	RC/+6473JT+++	CARBON T 47K OHM J 1/6W
R560	RC/+6154JT+++	CARBON T 150K OHM J 1/6W
R561	RC/+6101JT+++	CARBON T 100 OHM J 1/6W
R562	RC/+6151JT+++	CARBON T 150 OHM J 1/6W
R563	RC/+6333JT+++	CARBON T 33K OHM J 1/6W
R564	RC/+6333JT+++	CARBON T 33K OHM J 1/6W
R565	RC/+6102JT+++	CARBON T 1K OHM J 1/6W
R566	RC/+6102JT+++	CARBON T 1K OHM J 1/6W
R601	⚠ RF/+44R7JSRFR	FUSE RESISTOR S 4.7 OHM J 1/4W R25
R602	⚠ RF/+44R7JSRFR	FUSE RESISTOR S 4.7 OHM J 1/4W R25
R603	RM/+2R47JP+++	METAL P 0.47 OHM J 1/2W
R604	RM/+2R47JP+++	METAL P 0.47 OHM J 1/2W
R606	RF/+4330JSFPR	FP-CARBON S 33 J 1/4W R25
R607	RC/+6222JT+++	CARBON T 2.2K OHM J 1/6W
R608	⚠ RC/+6331JT+++	CARBON T 330 OHM J 1/6W
R609	⚠ RC/+6331JT+++	CARBON T 330 OHM J 1/6W
R621	RC/+6102JT+++	CARBON T 1K OHM J 1/6W
R622	RC/+6222JT+++	CARBON T 2.2K OHM J 1/6W

PARTS LIST

Ref. No.	Part No.	Description
R623	RC/+6562JT+++	CARBON T 5.6K OHM J 1/6W
R624	RC/+6104JT+++	CARBON T 100K OHM J 1/6W
R625	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R626	RC/+6102JT+++	CARBON T 1K OHM J 1/6W
R632	RC/+6222JT+++	CARBON T 2.2K OHM J 1/6W
R634	RC/+6223JT+++	CARBON T 22K OHM J 1/6W
R635	RC/+6683JT+++	CARBON T 68K OHM J 1/6W

POWER SWITCH PCB ASSY

Ref. No.	Part No.	Description
56	⚠ 141-4-285T-77674	P.C BOARD ASSY, POWER SWITCH
S901	⚠ 4-238T-70480	SWITCH, POWER
C901	⚠ 4-223T-12100	CAPACITOR, 0.01MF 400V
or	⚠ 4-223T-12280	CAPACITOR, 0.01MF

DISPLAY PCB ASSY

Ref. No.	Part No.	Description
57	141-4-285T-78100	P.C BOARD ASSY, DISPLAY
	4-985T-03700	FLUORESCENT DISPLAY
	141-2-210T-65901	BRACKET, FLUORESCENT DISPLAY
	141-2-448T-26100	CUSHION, 3X10X3
S701	4-238T-70873	SWITCH, MEMORY
or	4-238T-90173	SWITCH, MEMORY
S702	4-238T-70873	SWITCH, FWD SEARCH
or	4-238T-90173	SWITCH, FWD SEARCH
S703	4-238T-70873	SWITCH, PLAY/PAUSE
or	4-238T-90173	SWITCH, PLAY/PAUSE
S704	4-238T-70873	SWITCH, STOP
or	4-238T-90173	SWITCH, STOP
S705	4-238T-70873	SWITCH, BACK SEARCH
or	4-238T-90173	SWITCH, BACK SEARCH
S706	4-238T-70873	SWITCH, REPEAT
or	4-238T-90173	SWITCH, REPEAT
S707	4-238T-70873	SWITCH, FWD SKIP
or	4-238T-90173	SWITCH, FWD SKIP
S708	4-238T-70873	SWITCH, BACK SKIP
or	4-238T-90173	SWITCH, BACK SKIP
CN8	4-267T-27600	SOCKET, 8P
CN9	4-267T-27700	SOCKET, 11P
CN10	4-267T-27800	SOCKET, 12P
IC701	SILB1272+++++	IC LB1272 DIP14
or	SILB1275+++++	IC LB1275 DIP16
D701	SDDS442+X+++T	DIODE DS442 X
or	SD1S2473++++T	DIODE 1S2473T-77
D702	SDDS442+X+++T	DIODE DS442 X
or	SD1S2473++++T	DIODE 1S2473T-77
D703	SDDS442+X+++T	DIODE DS442 X
or	SD1S2473++++T	DIODE 1S2473T-77
D711	SLSLP938C50RE	LED SLP938C-50 RE
D712	SLSLP982A50RE	LED SLP982A-50 RE
D713	SLSLP282FU5GR	LED SLP282F-50 U GR
C701	CC+50473ZDZFS	CERAMIC 0.047MF 50V Z D ZF
C702	CC+50223ZDZFS	CERAMIC 0.022MF 50V Z D ZF
R701	RC/+4330JT++R	CARBON T 33 OHM J1/4WR25
R702	RC/+4330JT++R	CARBON T 33 OHM J1/4WR25
R703	RC/+4330JT++R	CARBON T 33 OHM J1/4WR25

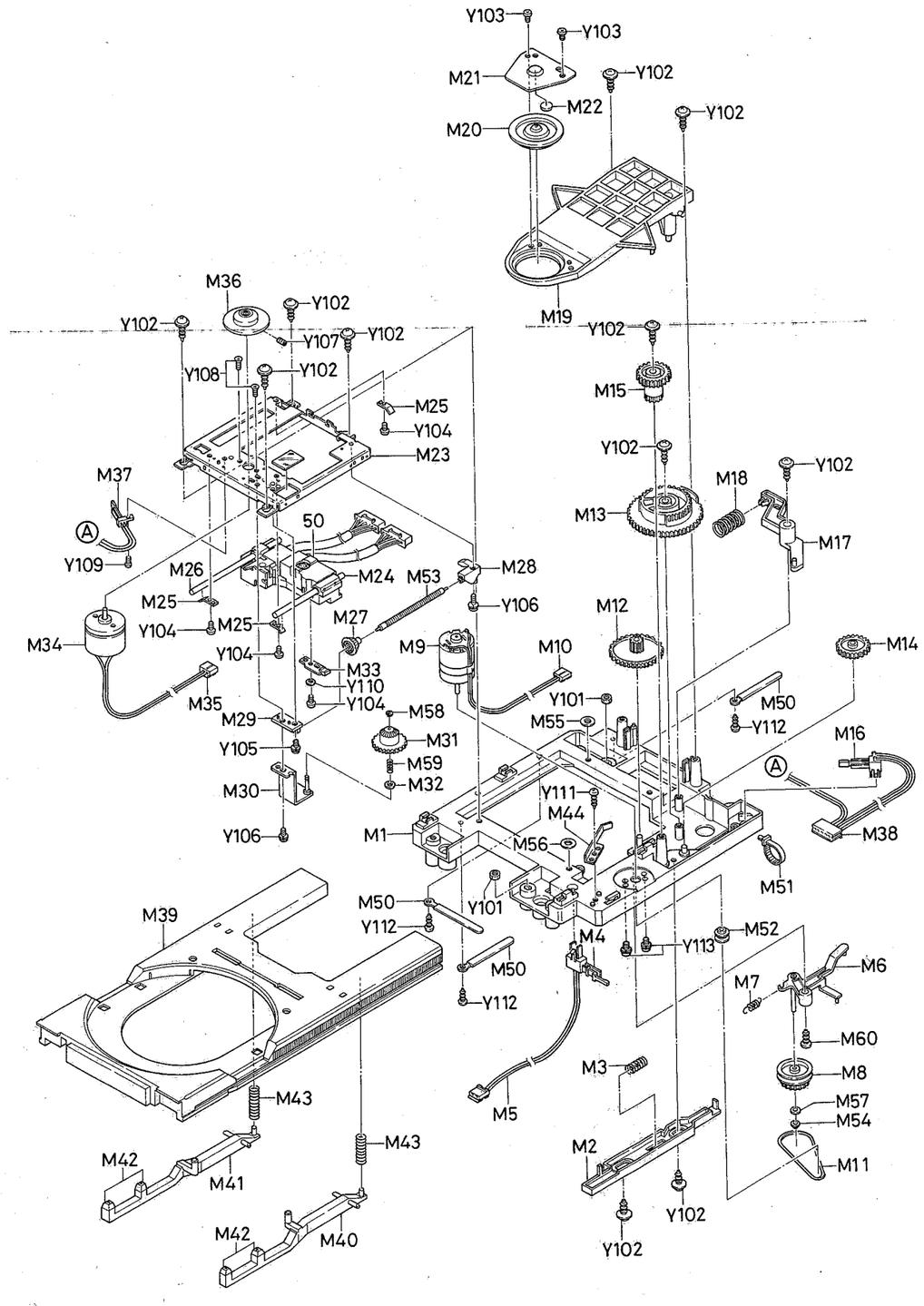
PARTS LIST

MECHANISM (PM-DADS02)

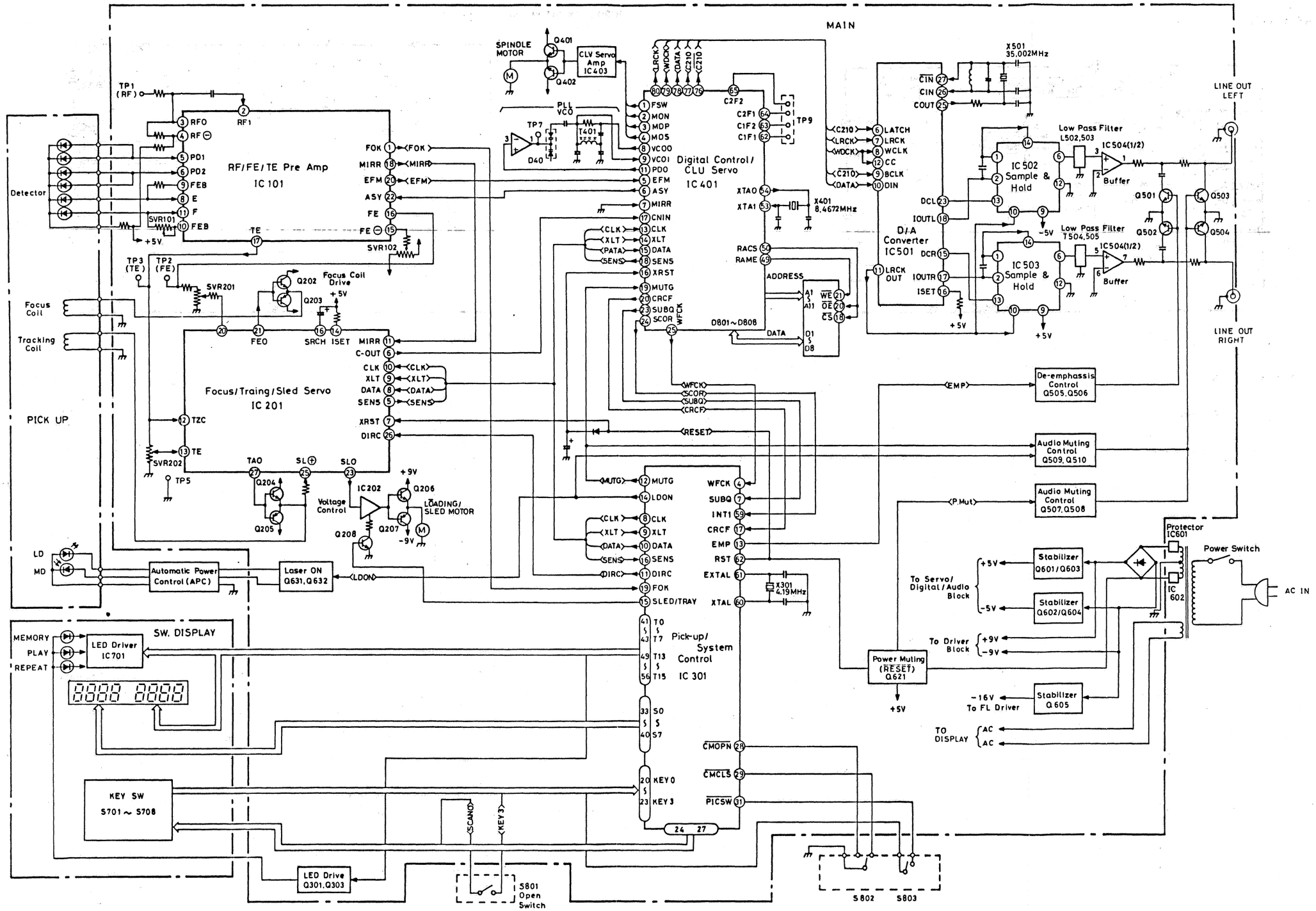
Ref. No.	Part No.	Description
M1	141-2-311T-53700	CHASSIS, TRAY SLIDE LOADING
M2	141-2-210T-78500	BRACKET, OPEN/CLOSE SWITCH
M3	141-2-856T-63300	SPRING COIL, BRACKET (M2) RETURN
M4	4-238T-63700	SWITCH, OPEN/CLOSE (S801)
M5	4-267T-24000	SOCKET, OPEN/CLOSE SWITCH
M6	141-0-740T-44900	LEVER ASSY, PULLEY (M8) MTG.
M7	141-2-856T-63200	SPRING COIL, LEVER ASSY RETURN
M8	141-2-661T-48500	PULLEY, RELAY
M9	4-527T-31300	COMMUTATE MOTOR, LOADING
M10	4-267T-24300	SOCKET, LOADING MOTOR
M11	141-2-564T-41700	SQUARE BELT
M12	141-2-581T-48100	GEAR, RELAY
M13	141-2-581T-48000	GEAR, CUM
M14	141-2-581T-47600	GEAR, RELAY, TRAY DRIVING GEAR
M15	141-2-581T-47700	GEAR, TRAY DRIVING
M16	4-238T-94471	SWITCH, LOADING (S802)
M17	141-2-740T-45000	LEVER, CHUCK LEVER ACTUATE
M18	141-2-856T-63100	SPRING COIL, LEVER (M17) RETURN
M19	141-2-740T-45100	LEVER, CHUCKING
M20	141-2-661T-48400	PULLEY, CHUKING LEVER
M21	141-2-290T-19900	BRACKET, PULLEY (M20) MTG
M22	141-2-247T-57400	SHEET, PULLEY (M20)
M23	141-2-311T-53201	CHASSIS, MECHANISM BASE
M24	141-2-754T-88300	SHAFT, PICK-UP MTG, SHORTER
M25	141-2-853T-93700	SPRING PLATE, SHAFT MTG
M26	141-2-754T-88400	SHAFT, PICK-UP MTG, LONGER
M27	141-2-581T-47900	GEAR, PICK-UP ACTUATE
M28	141-2-290T-18300	BRACKET, SHAFT (M26) MTG
M29	141-2-210T-78600	BRACKET, GEAR (M27) MTG
M30	141-0-290T-19800	BRACKET ASSY, RELAY GEAR FOR PICK-UP
M31	141-2-581T-47800	GEAR, RELY, PICK-UP ACTUATE
M32	141-2-856T-69400	SPRING COIL, RELAY GEAR (M31) PRESSING
M33	141-0-853T-93900	SPRING PLATE ASSY, PICK-UP
M34	4-527T-31400	COMMUTATE MOTOR, SPINDLE
M35	4-267T-24100	SOCKET, SPINDLE MOTOR
M36	141-2-118T-04500	TURNTABLE
M37	4-238T-87900	SWITCH, LIMIT (S803)
M38	4-267T-24200	SOCKET, LIMIT/LOADING SWITCH
M39	141-2-732T-42700	SLIDE, TRAY
M40	141-2-740T-44700	LEVER, DISC UP-DOWN, RIGHT
M41	141-2-740T-44800	LEVER, DISC UP-DOWN, LEFT
M42	141-2-445T-34500	RUBBER CUSHION, DISC
M43	141-2-856T-63000	SPRING COIL, LEVER (M40/M41) RETURN
M44	141-2-853T-89600	SPRING PLATE, TRAY SLIDE PRESSING
M45	141-2-445T-32700	RUBBER CUSHION, FLOATING
M46	141-2-856T-45100	SPRING COIL, SHIPPING SCREW
M47	141-2-421T-56101	SPECIAL SCREW, SHIPPING
M48	141-2-457T-23000	E RING, 2MM, SHIPPING SCREW
M49	141-2-290T-20100	BRACKET PICK-UP FIXING
M50	141-2-472T-01001	LUG, LEAD ALIGNMET
M51	141-2-464T-43100	FIXER, LEAD ALIGNENT
M52	141-2-661T-78900	PULLEY, LOADING MOTOR
M53	141-2-421T-62900	SPECIAL SCREW, PICK-UP ACTUATE
M54	141-2-453T-33100	WASHER, GRAPHITE NYLON, 1.6X3.2X0.25
M55	141-2-453T-30701	WASHER, GRAPHITE NYLON, 5.2X8X0.25
M56	141-2-453T-30700	WASHER, GRAPHITE NYLON, 5.2X8X0.13
M57	141-2-453T-30100	WASHER, GRAPHITE NYLON, 2.1X4.0X0.13
M58	141-2-453T-33100	WASHER, GRAPHITE NYLON, 1.6X3.2X0.25
M59	141-2-457T-38400	SPECIAL WASHER, GRAPHITE NYLON, 2.1X5X0.5

Ref. No.	Part No.	Description
M60	141-2-421T-41000	SPECIAL SCREW, LEVER ASSY MTG
Y101	NJR1S++3+++Z1	HEX NUT 1 3
Y102	BJX6S++3+8+Z1	PAN WASHER HD 2 TAPPING SCREW 3X8
Y103	BJB2S2R6+4+Z1	BIND HD 2 TAPPING SCREW 2.6X4
Y104	BJNBS++2+2+Z1	PAN HD SCREW 2X2
Y105	BJX2S2R6+4+Z1	PAN HD SCREW W/SPRING WASHER 2.6X4
Y106	BJX2S2R6+5+Z1	PAN HD SCREW W/SPRING WASHER 2.6X5
Y107	BJAMS++2+6MCP	HEX SOCKET HEADLESS SCREW 2X6
Y108	BS1NS++2+4+ZK	PAN HD 1 SPECIAL SCREW 2X4
Y109	BS3NS1R7+3+Z1	PAN HD 3 SPECIAL SCREW 1.7X3
Y110	WJBWS++2R04Z1	WASHER 2X6X0.4T
Y111	BJB2S++3+6+Z1	BIND HD 2 TAPPING SCREW 3X6
Y112	BJB2S++3+8+Z1	BIND HD 2 TAPPING SCREW 3X8
Y113	BJX2S2R6+5+Z1	PAN HD SCREW W/SPRING WASHER 2.6X5

MECHANISM EXPLODED VIEW

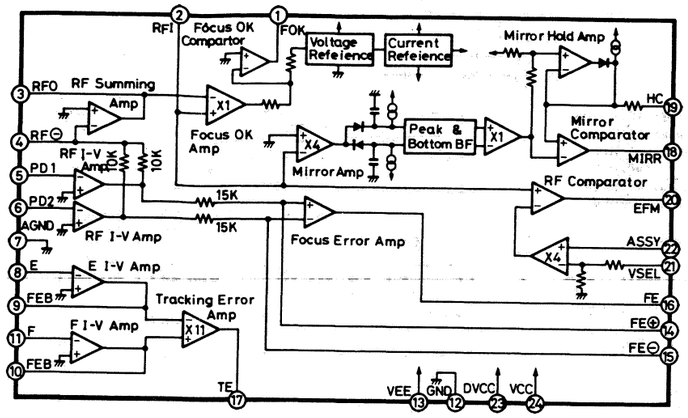


BLOCK DIAGRAM (2)



IC BLOCK DIAGRAM (1)

IC101 CX20109 (RF Amplifier)



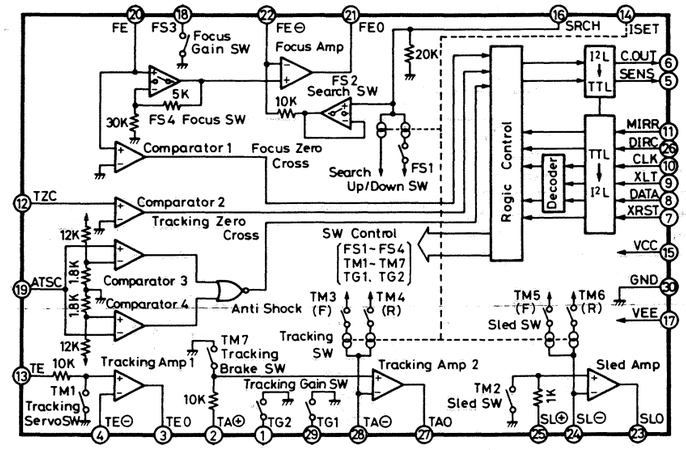
Pins Functions of IC101 (CX20109)

Pin No.	Pin name	Input/ Output	Function	DC Volt
1	FOK	Output	Output to enable focus servo operation. It is active with comparator output set at High level. Load resistor connection (PNP open collector).	0V
2	RFI	Input	Output of RF summing amplifier is here input through C coupling.	0V
3	RFO	Output	Output of RF summing amplifier. Eye pattern test point.	V RF0
4	RF (–)	Input	Inverted input of RF summing amplifier. Feedback CR connection between pins (3) and (4).	0V
5	PD1	Input	Inverted input of RF I-V amplifier (1). Current input in connection with PIN diode B+D.	0V
6	PD2	Input	Inverted input of RF1-V amplifier (2). Current input in connection with PIN diode A+C.	0V
7	AGND	—	Ground for minor signal analog system.	0V
8	E	Input	Inverted input of E I-V amplifier. Current input in connection with PIN diode E.	0V
9	EFB	Output	Output of E I-V amplifier. Feedback CR connection between pins (8) and (9).	0V
10	FFB	Output	Output of F I-V amplifier. Feedback CR connection between pins (10) and (11).	0V
11	F	Input	Inverted input of F I-V amplifier. Current input in connection with PIN diode F.	0V

Pin No.	Pin name	Input/ Output	Function	DC Volt
12	GND	—	Ground.	0V
13	V_{EE}	—	Negative power supply.	–5V
14	FE(+)	Input	Non-inverted input of focus error amplifier. CR connection for low pass filter.	0V
15	FE(–)	Input	Inverted input of focus error amplifier.	0V
16	FE	Output	Output of focus error amplifier. Feedback CR connection between pins (15) and (16).	V FE0
17	TE	Output	Output of tracking error amplifier.	V TE0
18	MIRR	Output	Output of mirror comparator (active at High level). Load resistor connection (PNP open collector).	0V
19	HC	Input	Connection pin for mirror hold capacitor.	–2V
20	EFM	Output	Output of EFM comparator (voltage measured at open state).	4.1V
21	VSEL	Input	Reference input level setting pin for auto asymmetry control amplifier. VCC with ±5V power, GND with +10V power.	+5V
22	ASY	Input	Input of auto asymmetry control amplifier.	—
23	D V_{CC}	—	Positive power supply for EFM comparator.	+5V
24	V_{CC}	—	Positive power supply.	+5V

IC BLOCK DIAGRAM (2)

IC201 CX20108 (Servo Signal Processor)



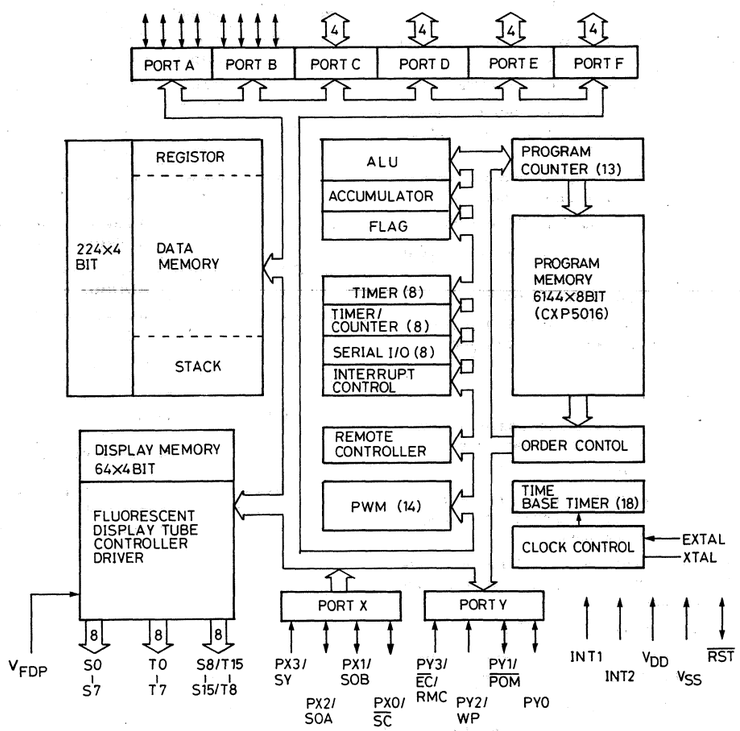
Pins Functions of IC201 (CX20108)

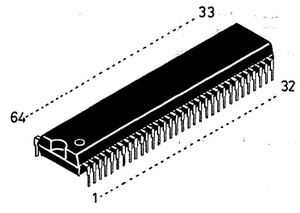
Pin No.	Pin name	Input/ Output	Function
1	TG2	—	Gain selection pin of tracking amplifier. It is opened or set at ground level.
2	TA (+)	—	Non-inverted input of operational amplifier 2.
3	TE0	—	Output of operational amplifier 4.
4	TE (–)	—	Inverted input of operational amplifier 4.
5	SENSE	Output	Output of SSP internal state in accordance with CPU → SSP addresses. (The output varies depending upon the address contents of internal serial register.)
6	C. OUT	Output	Output for track number counting at the time of high speed accessing.
7	XRST	Input	All the contents of internal register are cleared with CPU → SSP set at Low level. This signal is connected to CPU reset pin.
8	DATA	Input	Serial data transfer of CPU → SSP. This signal is input from LSB. D0 ~ D7.
9	XLT	Input	Serial data latch of CPU → SSP. When this signal is at Low level, the contents of internal serial shift register are transferred to the respective address-decoded latches. After the transfer, it is needed to return it to High level as there arises no trigger signal.
10	CLK	Input	Serial data transfer clock for CPU → SSP. Data entry is allowed at the falling edge of this signal. Before or after the transfer, it is needed to set the signal at High level.
11	MIRR	Input	Mirror signal input from RF amplifier.
12	TZC	—	Tracking error signal is here input through C coupling. Time constant is decided by 1-track jump (usually set at about 2 kHz).
13	TE	—	Tracking error input signal.

Pin No.	Pin name	Input/ Output	Function
14	ISET	—	Amperage setting pin to decide focus search voltage, tracking jump voltage and sled forward voltage.
15	V_{CC}	—	Power supply pin (usually +5V).
16	SRCH	—	Connected to capacitor which decides the time constant for charge/discharge waveform of focus search operation.
17	V_{EE}	—	Power supply pin (usually –5V).
18	FS3	—	Gain selection pin of focus amplifier. It is opened or set at ground level.
19	ATSC	—	If the player is exposed to some mechanical shock, its information is here input. This is enabled simply by application of tracking error signal through band pass filter. If this pin is not used, it must be connected to ground.
20	FE	—	Focus error signal input.
21	FE0	—	Output of operational amplifier 1.
22	FE(–)	—	Inverted input of operational amplifier 1.
23	SLO	—	Output of operational amplifier 3.
24	SL(–)	—	Inverted input of operational amplifier 3.
25	SL(+)	—	Non-inverted input of operational amplifier 3.
26	DIRC	Input	This signal is used during 1-track jump operation and is usually set at High level. When it is at Low level, it reverses the direction of track jump pulse. When it is next set at High level, the unit gets in normal tracking mode. It is kept at Low level for a certain time with detection of the rising and folling edges of TZC signal.
27	TAO	—	Output of operational amplifier 2.
28	TA(–)	—	Inverted input of operational amplifier 2.
29	TG1	—	Gain selection pin of tracking amplifier. It is opened or set at ground level.
30	GND	—	Ground of IC.

IC BLOCK DIAGRAM (3)

IC301 CXP5016H C-MOS 4-Bit 1-Chip Micro Computer





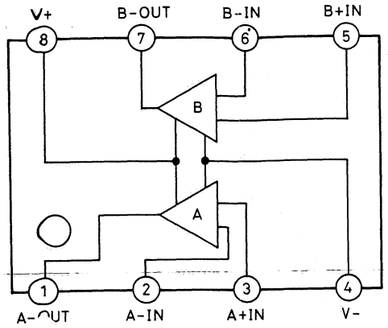
IC BLOCK DIAGRAM (4)

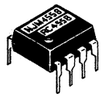
Pins Functions of IC301 (CXP5016H)

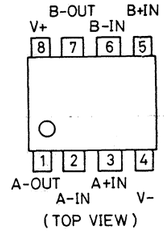
Pin No.	Pin name	Input/ output	Function name	Allocated function	Basic function
1	PWM/ PY1	Output	REC	Direct call output	PWM output or output port
2	WP/PY2	Input	NC	(Ground)	Wake up input or input port
3	RMC/EC/ PY3	Input	WFCK	WFCK signal (pin 25 of IC401)	Remote control input, event count input or input port
4	SC/PX0	Input/ output	WFCK	WFCK signal (pin 25 of IC401)	Sirial clock or input port
5	SOB/PX1	Input/ output	NC	(Ground)	Sirial output or input port
6	SOA/PX2	Input/ output	NC	(Ground)	Sirial output or input port
7	SI/PX3	Input	SUBQ	Sub Q data input port (pin 23 of IC401)	Sirial input or input port
8	PD0	Input/ output	CLK	Clock (pin 10 of IC201, pin 13 of IC401)	Input/output port
9	PD1	Input/ output	XLT	Latch signal (pin 9 of IC201, pin 14 of IC401)	Input/output port
10	PD2	Input/ output	DATA	Data signal (pin 8 of IC201, pin 15 of IC401)	Input/output port
11	PD3	Input/ output	DIRC	DIRC signal (pin 26 of IC302)	Input/output port
12	PC0	Input/ output	MUTING	Muting	Input/output port
13	PC1	Input/ output	EMPHA-SYS	Emphasis	Input/output port
14	PC2	Input/ output	LDON	Laser diode on signal	Input/output port
15	PC3	Input/ output	SLED/ TRAY	SLED/TRAY signal	Input/output port
16	PF0	Input/ output	SENS	Sense signal (pin 5 of IC201, pin 18 of IC401)	Input/output port
17	PF1	Input/ output	CRCF	CRC OK signal (pin 20 of IC401)	Input/output port
18	PF2	Input/ output	NC	(High level)	Input/output port
19	PF3	Input/ output	FDK	Focus OK signal (pin 1 of IC101)	Input/output port
20	PE0	Input/ output	KEY0	Key input port	Input/output port
21	PE1	Input/ output	KEY1	Key input port	Input/output port
22	PE2	Input/ output	KEY2	Key input port	Input/output port
23	PE3	Input/ output	KEY3	Key input port	Input/output port
24	PB0	Input/ output	SCN0	Scan output port	Input/output port
25	PB1	Input/ output	SCN1	Scan output port	Input/output port
26	PB2	Input/ output	SCN2	Scan output port	Input/output port
27	PB3	Input/ output	SCN3	Scan output port	Input/output port
28	PA0	Input/ output	CMOPN	Signal to show that disc tray has been completely opened	Input/output port
29	PA1	Input/ output	CMCLS	Signal to show that disc tray has been completely closed	Input/output port
30	PA2	Input/ output	DCALL	Direct call signal	Input/output port
31	PA3	Input/ output	PICSW	Pick-up initial return switch	Input/output port
32	VSS	—	VSS	Power supply (ground)	0V
33	S0	Output	S0	7-segment output	Output port
34	S1	Output	S1	7-segment output	Output port
35	S2	Output	S2	7-segment output	Output port
36	S3	Output	S3	7-segment output	Output port
37	S4	Output	S4	7-segment output	Output port
38	S5	Output	S5	7-segment output	Output port
39	S6	Output	S6	7-segment output	Output port
40	S7	Output	S7	DP-segment output	Output port
41	T15/S8	Output	T15	Timing signal	Output port
42	T14/S9	Output	T14	Timing signal	Output port
43	T13/S10	Output	T13	Timing signal	Output port
44	T12/S11	Output	T12	Open	Output port
45	T11/S12	Output	T11	Open	Output port
46	T10/S13	Output	T10	Open	Output port
47	T9/S14	Output	T9	Open	Output port
48	T8/S15	Output	T8	Open	Output port
49	T7	Output	T7	Timing signal	Output port
50	T6	Output	T6	Timing signal	Output port
51	T5	Output	T5	Timing signal	Output port
52	T4	Output	T4	Timing signal	Output port
53	T3	Output	T3	Timing signal	Output port
54	T2	Output	T2	Timing signal	Output port
55	T1	Output	T1	Timing signal	Output port
56	T0	Output	T0	Timing signal	Output port
57	V_{FDP}	Input	V_{FDP}	Power supply for FDP (–16V)	Power supply for FDP
58	INT2	Input	INT2	(+5V)	Interruption input
59	INT1	Input	INT1	SCOR signal (pin 24 of IC401)	Interruption input
60	XTAL	Output	XTAL	Clock signal (4.19 MHz)	Connected to osillator
61	EXTAL	Input	EXTAL	Clock signal (4.19 MHz)	Connected to oscillator
62	$\overline{RST}$	Input/ output	RST	Reset	Initialize signal input
63	RY0	Output	WW16	Direct call output	Output port
64	V_{DD}	—	VDD	Power supply (+5V)	+5V

IC BLOCK DIAGRAM (5)

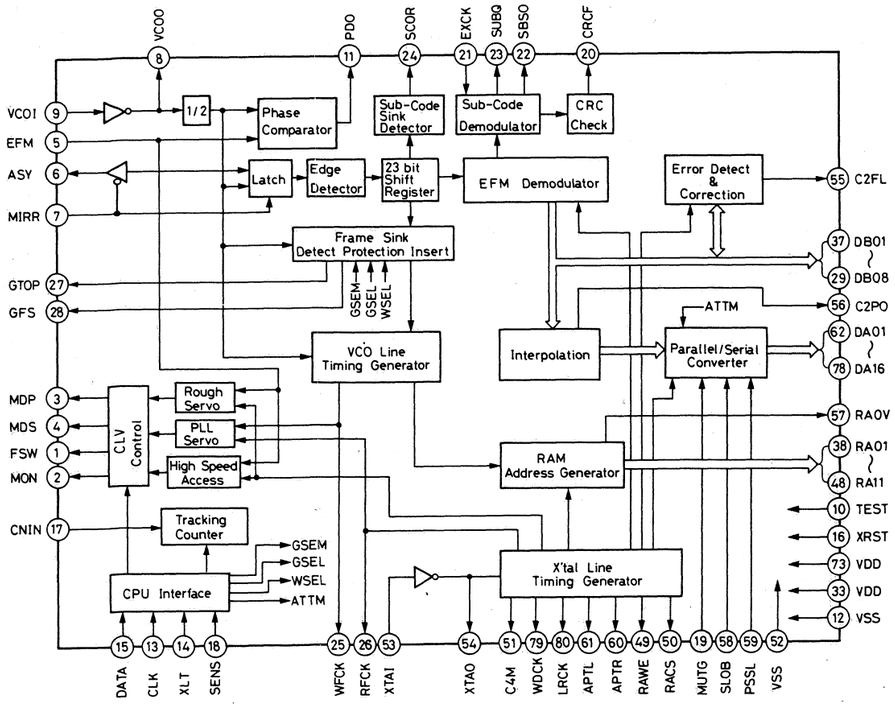
IC202/IC504 NJM4558D (Dual Op-Amplifier)

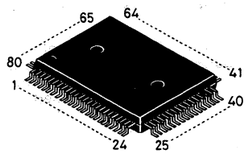






IC401 CX23035 (Digital Signal Processor)





IC BLOCK DIAGRAM (6)

Pins Functions of IC401 (CX23035)

Pin No.	Pin name	Input/ output	Function
1	FSW	Output	Time constant selection output for output filter of spindle motor.
2	MON	Output	On/off control output of spindle motor.
3	MDP	Output	Drive output of spindle motor. It allows rough control at CLV-S mode and phase control at CLV-P mode.
4	MDS	Output	Drive output of spindle motor. It allows speed control at CLV-P mode.
5	EFM	Input	EFM signal input from RF amplifier.
6	ASY	Output	Output to control the slice level of EFM signal.
7	MIRR	Input	Mirror input from RF amplifier.
8	VCOO	Output	VCO output. It is set at 8.6436 MHz when it is locked with EFM signal.
9	VCOI	Input	VCO input.
10	TEST	Input	0V
11	PDO	Output	Output to compare the phases of FFM signal and VCO/2 with each other.
12	VSS	–	Ground (0V).
13	CLK	Input	Clock input of serial data transfer from CPU. The data is latched at the rising edge of clock signal.
14	XLT	Input	Latch input from CPU. Data (serial data from CPU) of 8-bit shift register is latched to each register.
15	DATA	Input	Serial data input from CPU.
16	XRST	Input	System reset input. The system is reset when the signal is at Low level.
17	CNIN	Input	Tracking pulse input.
18	SENS	Output	Output of internal state in accordance with the address.
19	MUTG	Input	Muting input. Provided that ATTM signal of internal register A is at Low level, the sound is normal when MUTG signal is at Low level and is muted when it becomes High level.
20	CRCF	Output	Output of CRC checking result by sub code Q.
21	EXCK	Input	Clock input for serial output of sub code.
22	SBSO	Output	Serial output of sub code.
23	SUBQ	Output	Output of sub code Q.
24	SCOR	Output	Output of sub code sync S0+S1.
25	WFCK	Output	Output of write frame clock. It is set at 7.35 kHz when it is locked with frame sync.
26	RFCK	Output	Output of read frame clock. It is set at 7.35 kHz by crystal oscillator.
27	GTOP	Output	Output to display the frame sync protection state.
28	GFS	Output	Output to display the frame sync lock state.
29	DB08	Input/ output	Data terminal of external RAM. DATA 8 (MSB).
30	DB07	Input/ output	Data terminal of external RAM. DATA 7.
31	DB06	Input/ output	Data terminal of external RAM. DATA 6.
32	DB05	Input/ output	Data terminal of external RAM. DATA 5.
33	VDD	–	Power supply (+5V).
34	DB04	Input/ output	Data terminal of external RAM. DATA 4.
35	DB03	Input/ output	Data terminal of external RAM. DATA 3.
36	DB02	Input/ output	Data terminal of external RAM. DATA 2.
37	DB01	Input/ output	Data terminal of external RAM. DATA 1 (LSB)
38	RA01	Output	Address output of external RAM. ADDR01 (LSB).
39	RA02	Output	Address output of external RAM. ADDR02.
40	RA03	Output	Address output of external RAM. ADDR03.

Note:
- C1F1·C1F2: Mountor output of error correction state in C1 decoding.
- C2F1·C2F2: Monitor output of error correction state in C2 decoding.
- UGFS: Output of frame sync pattern not subject to protection.
- WFCK: Inverted output of WFCK.
- FCKV: Output of WFCK/4 or WFCK/8.
- FCKX: Output of RFCK/4 or RFCK/8.

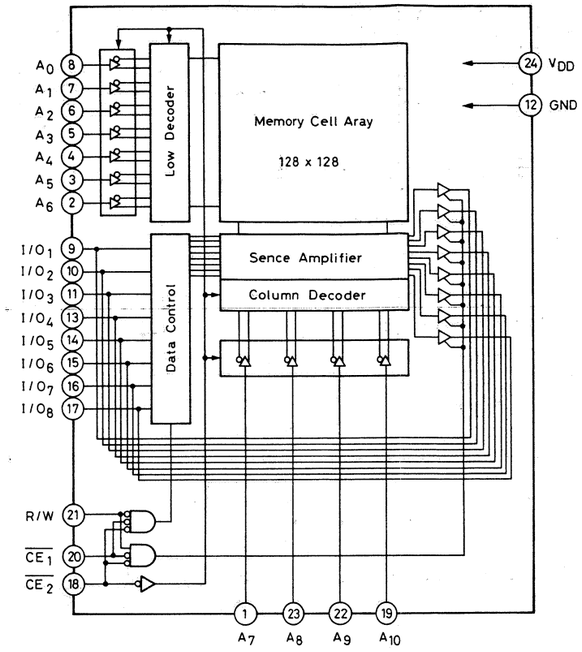
IC BLOCK DIAGRAM (7)

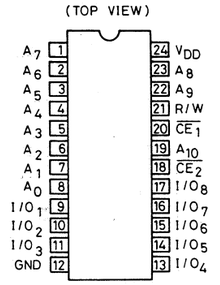
Pin No.	Pin name	Input/ output	Function
41	RA04	Output	Address output of external RAM. ADDR04.
42	RA05	Output	Address output of external RAM. ADDR05.
43	RA06	Output	Address output of external RAM. ADDR06.
44	RA07	Output	Address output of external RAM. ADDR07.
45	RA08	Output	Address output of external RAM. ADDR08.
46	RA09	Output	Address output of external RAM. ADDR09.
47	RA10	Output	Address output of external RAM. ADDR10.
48	RA11	Output	Address output of external RAM. ADDR11 (MSB).
49	RAWE	Output	Write enable signal output to external RAM (active at Low level).
50	RACS	Output	Chip select signal output to external RAM (active at Low level).
51	C4M	Output	1/2 frequency output of crystal oscillator. f = 4.2336 MHz.
52	VSS	–	Ground (0V)
53	XTAI	Input	Input of crystal oscillator circuit. f = 8.4672 MHz.
54	XTAO	Output	Output of crystal oscillator circuit. f = 8.4672 MHz.
55	C2FL	Output	Output of correction state. It becomes High level when C2 system to be corrected cannot be corrected.
56	C2PO	Output	Display output of C2 pointer. It is synchronized with audio data output.
57	RAOV	Output	Output to display the overflow and underflow of RAM for ±4 frame jitter absorption.
58	SLOB	Input	Code selection input of audio data output. It is complement output at Low level and offset binary output at High level.
59	PSSL	Input	Mode selection input of audio data output. It is serial output at Low level and parallel output at High level.
60	APTR	Output	Control output for aperture correction. It is at High level for R-channel correction.
61	APTL	Output	Control output for aperture correction. It is at High level for L-channel correction.
62	DA01	Output	DA01 (LSB of parallel audio data) is output when PSSL is at High level. C1F1 is output when PSSL is at Low level.
63	DA02	Output	DA02 is output when PSSL is at High level. C1F2 is output when PSSL is at Low level.
64	DA03	Output	DA03 is output when PSSL is at High level. C2F1 is output when PSSL is at Low level.
65	DA04	Output	DA04 is output when PSSL is at High level. C2F2 is output when PSSL is at Low level.
66	DA05	Output	DA05 is output when PSSL is at High level. UGFS is output when PSSL is at Low level.
67	DA06	Output	DA06 is output when PSSL is at High level. WFCK is output when PSSL is at Low level.
68	DA07	Output	DA07 is output when PSSL is at High level. FCKV is output when PSSL is at Low level.
69	DA08	Output	DA08 is output when PSSL is at High level. FCKX is output when PSSL is at Low level.
70	DA09	Output	DA09 is output when PSSL is at High level. PLCK is output when PSSL is at Low level.
71	DA10	Output	DA10 is output when PSSL is at High level. LRCK is output when PSSL is at Low level.
72	DA11	Output	DA11 is output when PSSL is at High level. C4LR is output when PSSLis at Low level.
73	VDD	–	Power supply (+5V).
74	DA12	Output	DA12 is output when PSSL is at High level. DENL is output when PSSL is at Low level.
75	DA13	Output	DA13 is output when PSSL is at High level. DENR is output when PSSL is at Low level.
76	DA14	Output	DA14 is output when PSSL is at High level. C210 is output when PSSL is at Low level.
77	DA15	Output	DA15 is output when PSSL is at High level. C210 is output when PSSL is at Low level.
78	DA16	Output	DA16 (MSB of parallel audio data) is output when PSSL is at High level. DATA is output when PSSL is at Low level.
79	WDCK	Output	Output of 88.2 kHz strobe signal.
80	LRCK	Output	Output of 44.1 kHz strobe signal.

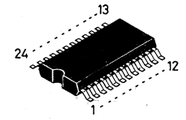
Note: PLCK: VC0/2 output. It is set at 4.3218 MHz when it is locked wth EFM signal.
C4LR: 176.4 kHz strobe signal.
DENL/DENR: L-channel serial data erable signal/R-channel serial data enable signal.
C210/210: Bit clock output (2.1168 MHz)/inverted output of C210.
DATA: Serial data output of audio signal.

IC BLOCK DIAGRAM (8)

IC402 TC5516AF-2 (C MOS 8 Bit x 2048 Wd Static RAM)



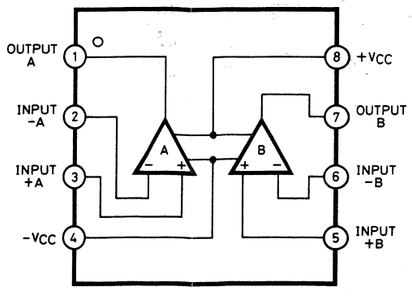




Pins Functions of IC402 (TC5516AF-2)

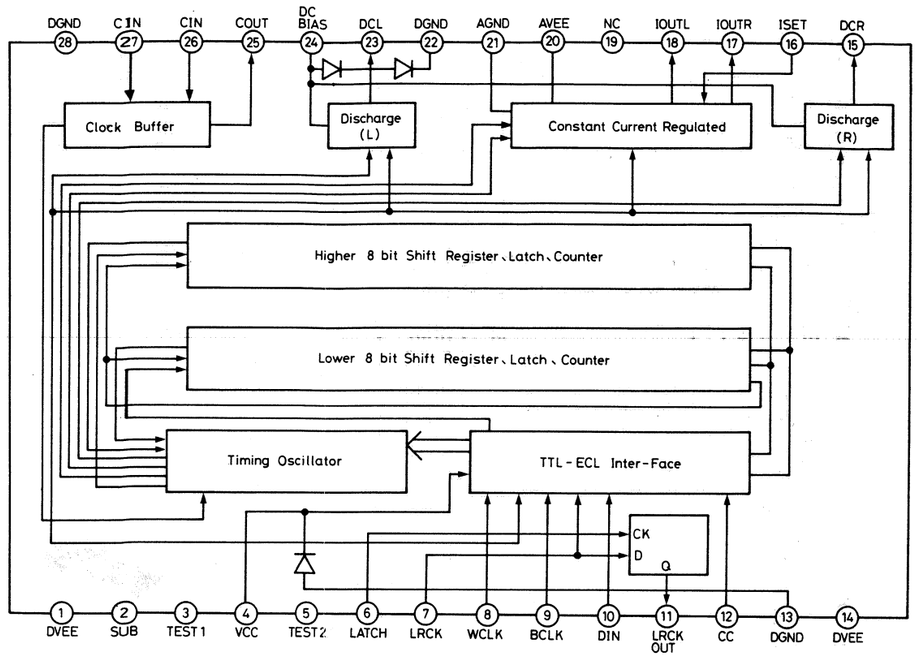
Pin No.	Pin name	I/O	Function
1 ~ 8	A7 ~ A0	I	Address input
19·22·23	A10·A9·A8	I	Address input
21	R/W	I	Read/Wright input
18·20	CE2·CE1	I	Chip enable input
9 ~ 11	I/O1 ~ I/O3	I/O	Data input/output
13 ~ 17	I/O4 ~ I/O8	I/O	Data input/output
24 12	VDD GND	– –	(+5V) (GND)

IC403 NJM082D (Dual OP-Amplifier)

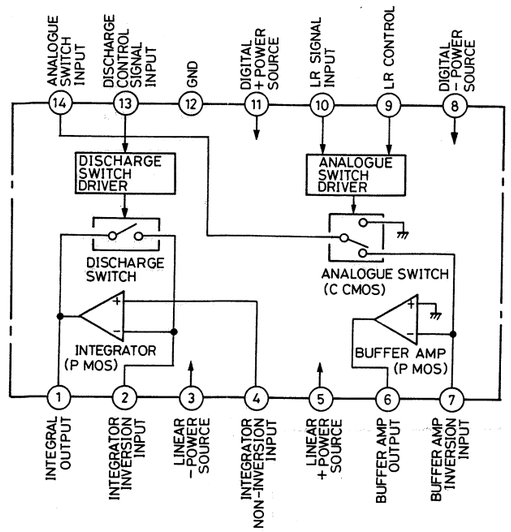


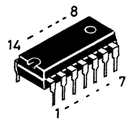
IC BLOCK DIAGRAM (9)

IC501 CX20017 (D/A Convertor)



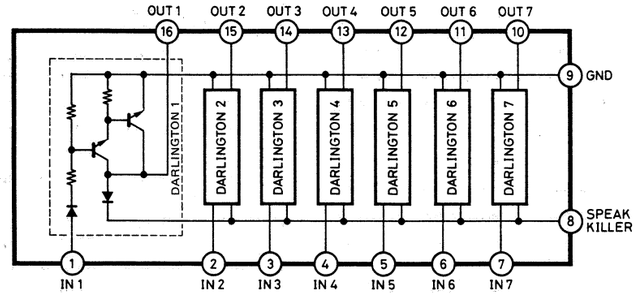
IC502·503 M51008P (D/A Converter Sample & Hold)



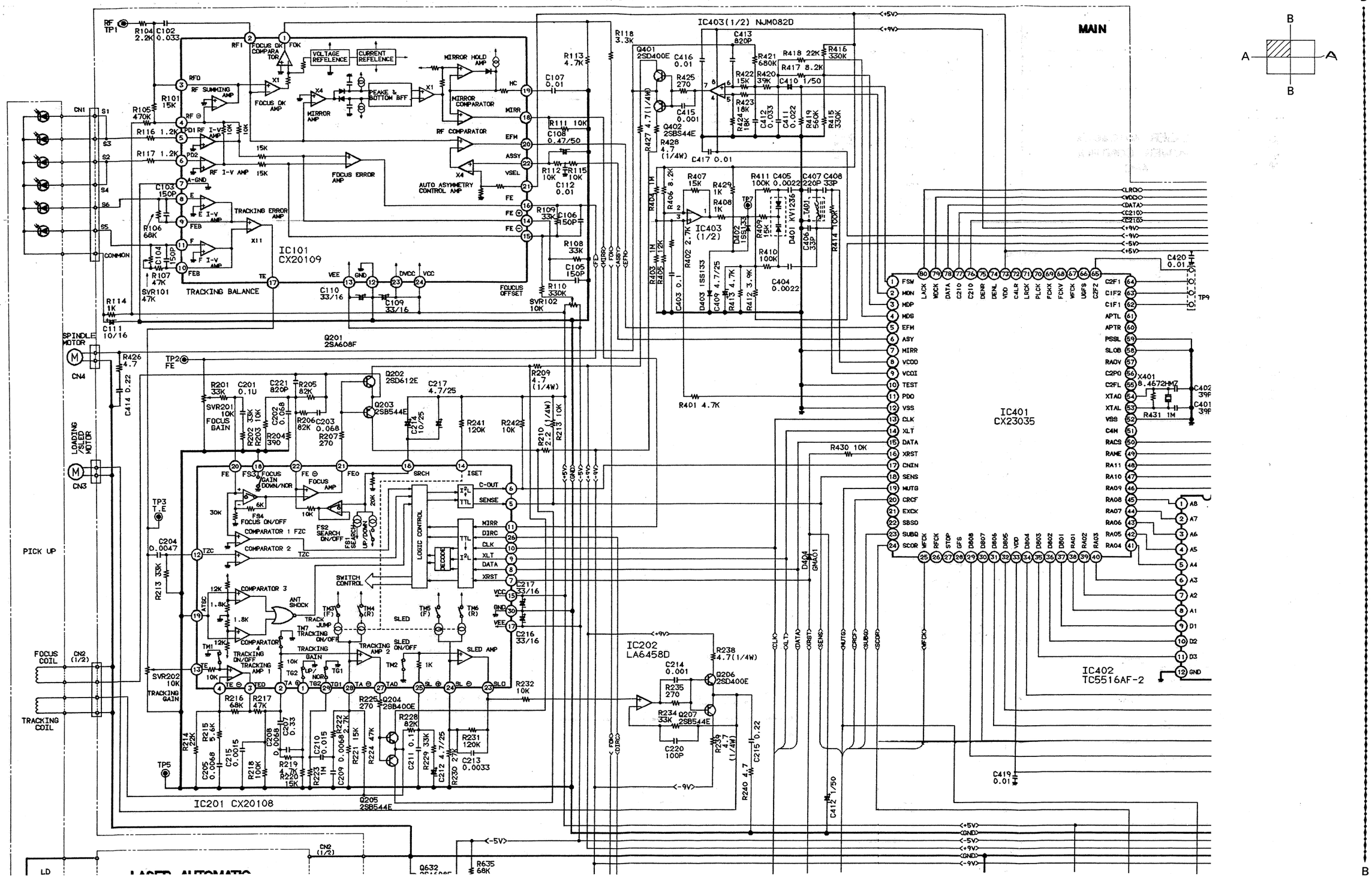


IC BLOCK DIAGRAM (10)

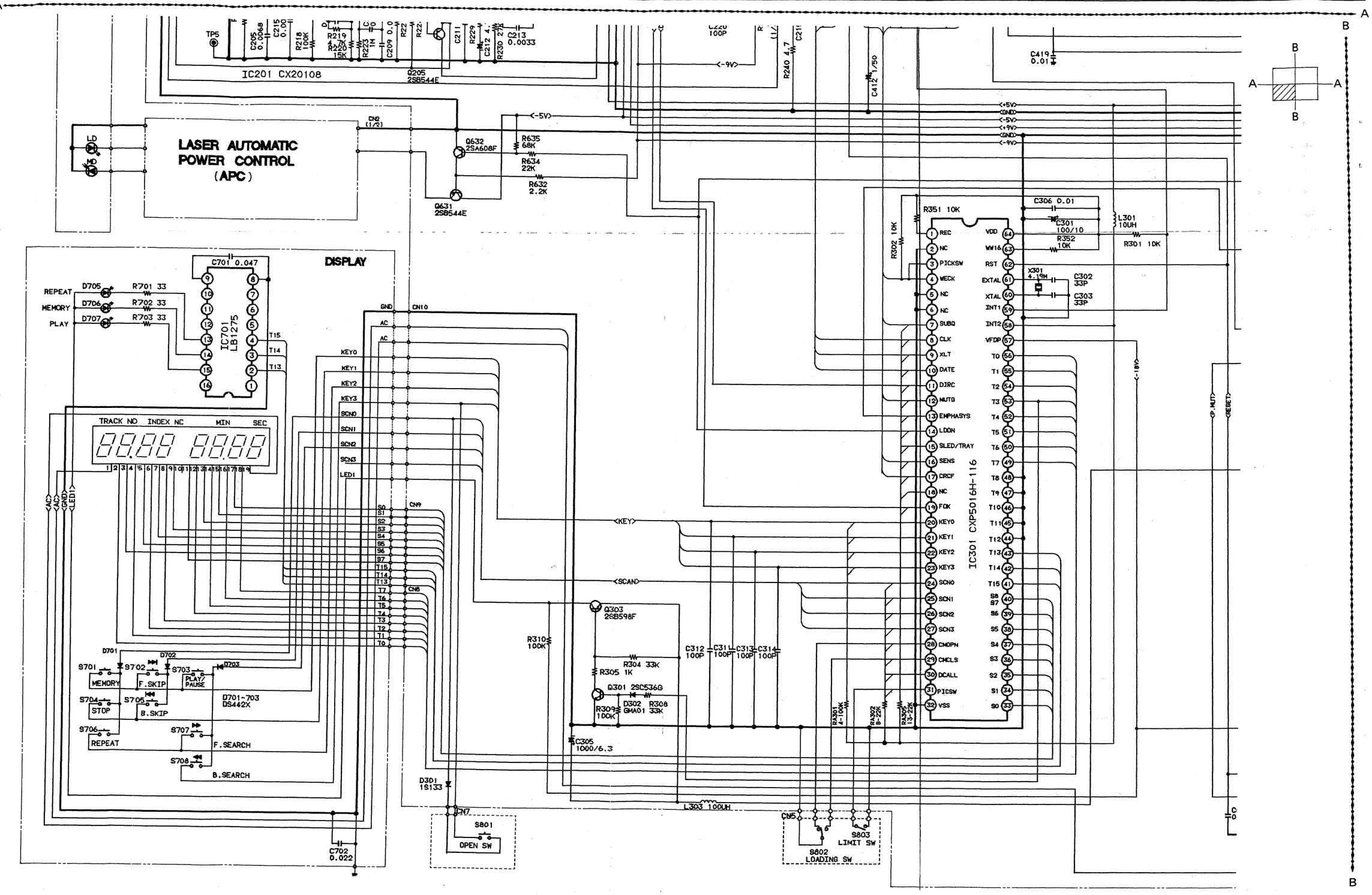
IC701 LB1275 (7-Circuit Darlington Transistor Array)



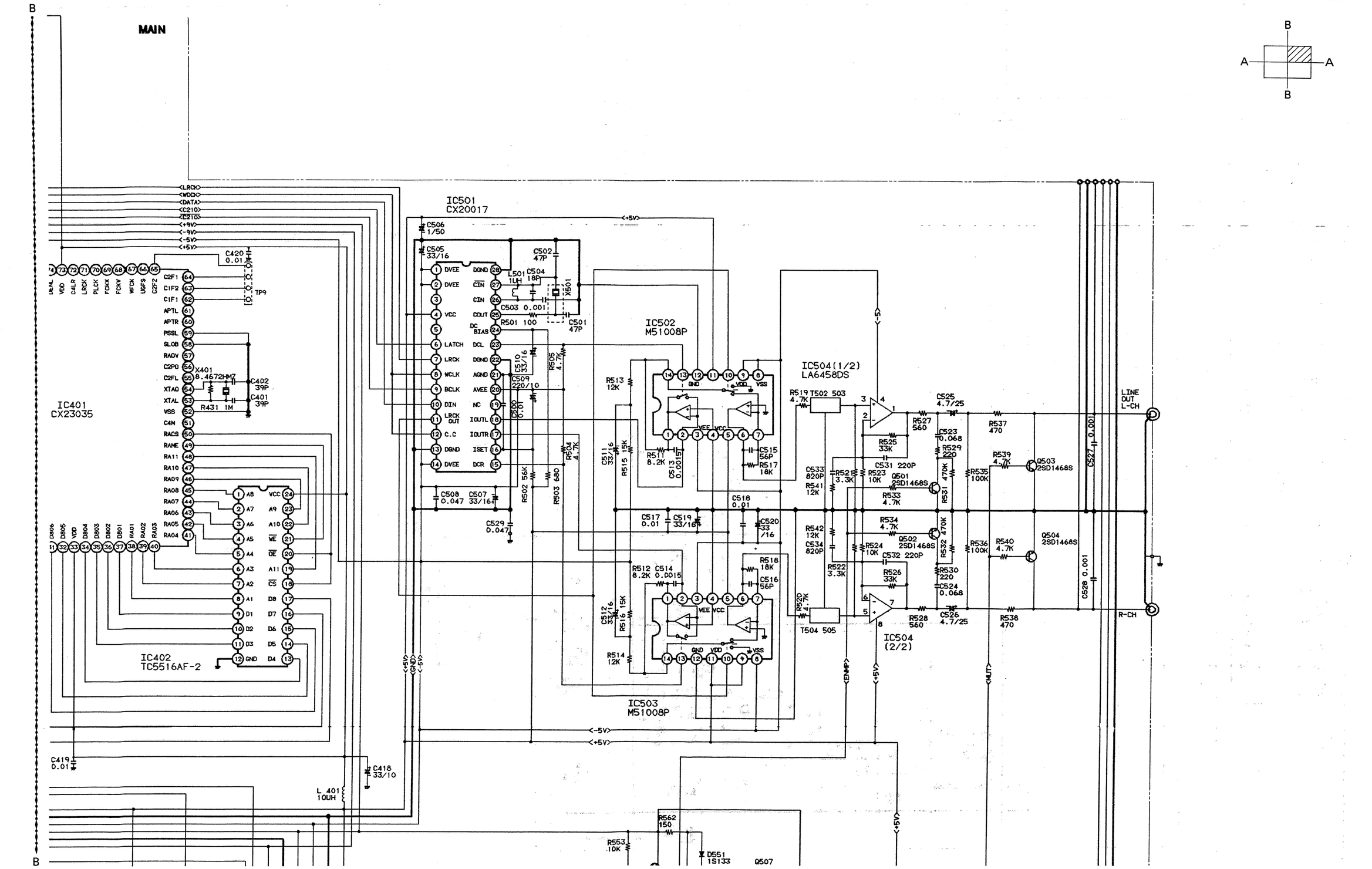
SCHEMATIC DIAGRAM (1)



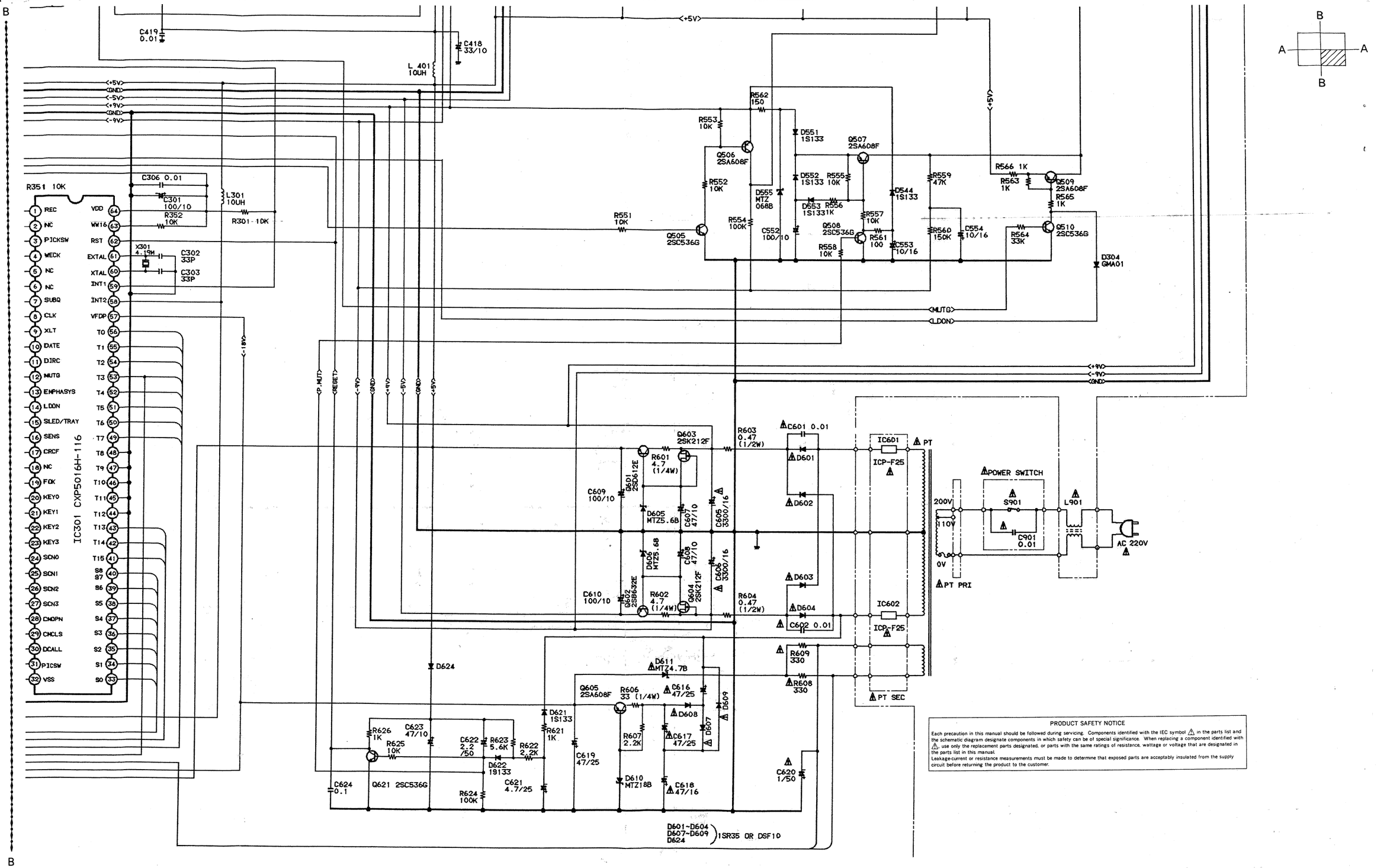
SCHEMATIC DIAGRAM (2)



SCHEMATIC DIAGRAM (3)

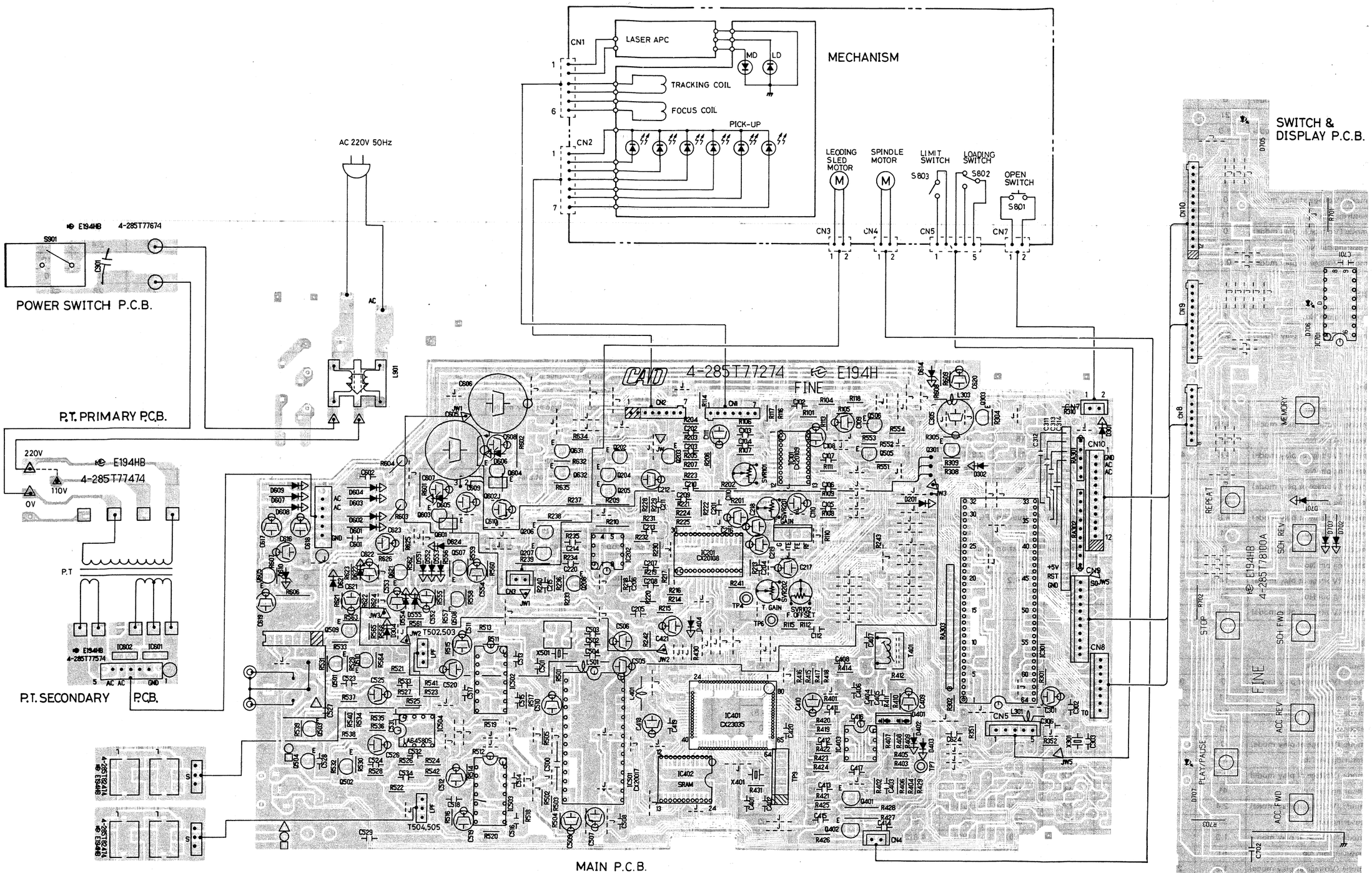


SCHEMATIC DIAGRAM (4)



PRODUCT SAFETY NOTICE

Each precaution in this manual should be followed during servicing. Components identified with the IEC symbol ⚠ in the parts list and the schematic diagram designate components in which safety can be of special significance. When replacing a component identified with ⚠, use only the replacement parts designated, or parts with the same ratings of resistance, wattage or voltage that are designated in the parts list in this manual.
Leakage-current or resistance measurements must be made to determine that exposed parts are acceptably insulated from the supply circuit before returning the product to the customer.


MECHANISM
CN1
LASER APC
MD
LD
TRACKING COIL
FOCUS COIL
PICK-UP
CN2
LEODING SLED MOTOR
SPINDLE MOTOR
LIMIT SWITCH
LOADING SWITCH
OPEN SWITCH
S803
S802
S801
CN3
CN4
CN5
CN7
SWITCH & DISPLAY P.C.B.
POWER SWITCH P.C.B.
E194HB 4-285T77674
S901
AC 220V 50Hz
P.T. PRIMARY P.C.B.
220V
110V
0V
E194HB
4-285T77474
P.T
P.T. SECONDARY P.C.B.
IC802
IC801
AC AC
GND
CAD 4-285T77274 E194H
FINE
IC401 CX23035
IC402 SRAM
IC201 CX20108
T502,503
T504,505
MAIN P.C.B.
E194HB
4-285T78100A
REPEAT
STOP
SCH REV
SCH FWD
ACC REV
ACC FWD
PLAY/PAUSE
MEMORY
FINE

VOLTAGES OF ICS (1)

The voltages of ICs and transistors shown below are those measured with a digital multimeter when the unit is operated on the power of AC220V 50Hz.

IC101 (CX20109)

(Unit: V)

Measuring pin No.	1	2	3	4	5	6	7	8	9	10
Voltage at stop mode (Voltage at play mode)	0(4.6)	0	−0.1	0	0	0	–	0	0	0
Measuring pin No.	11	12	13	14	15	16	17	18	19	20
Voltage at stop mode (Voltage at play mode)	0	–	−5.0	0	0	0	0	0	−2.0(1.5)	2.2
Measuring pin No.	21	22	23	24						
Voltage at stop mode (Voltage at play mode)	4.9	2.5	4.9	4.9						

IC201 (CX20108)

(Unit: V)

Measuring pin No.	1	2	3	4	5	6	7	8	9	10
Voltage at stop mode (Voltage at play mode)	0	0	0	0	2.8(4.9)	0.1	4.4	0.1	4.9	4.0(4.8)
Measuring pin No.	11	12	13	14	15	16	17	18	19	20
Voltage at stop mode (Voltage at play mode)	0	0	0	−4.2	4.9	0.2	−5.0	–	–	0
Measuring pin No.	21	22	23	24	25	26	27	28	29	30
Voltage at stop mode (Voltage at play mode)	0.6	0	0	0	0	4.9	0.6	0	0	–

IC202 (NJM4558D)

(Unit: V)

Measuring pin No.	1	2	3	4	5	6	7	8	9	10
Voltage at stop mode (Voltage at play mode)	9.9	9.0	9.9	−10.4	0* (−2.3 2.4)	0* (−2.3 2.4)	0.6* (−5 4.3)	10.4		

Note: * (TRAY OPEN, TRAY CLOSE)

IC301 (CXP5016H)

(Unit: V)

Measuring pin No.	1	2	3	4	5	6	7	8	9	10
Voltage at stop mode (Voltage at play mode)	4.9	–	2.4	2.4	–	–	1.7	4.0(4.8)	4.8	0
Measuring pin No.	11	12	13	14	15	16	17	18	19	20
Voltage at stop mode (Voltage at play mode)	4.8	4.8(0)	0	0(4.8)	4.8	2.8(4.8)	0(4.8)	4.8	1.3(4.6)	0
Measuring pin No.	21	22	23	24	25	26	27	28	29	30
Voltage at stop mode (Voltage at play mode)	0	0	0	0.7	0.7	0.7	0.7	4.8	0	4.8
Measuring pin No.	31	32	33	34	35	36	37	38	39	40
Voltage at stop mode (Voltage at play mode)	4.8	–	Fluctuation	Fluctuation	Fluctuation	Fluctuation	Fluctuation	Fluctuation	−16.3	Fluctuation
Measuring pin No.	41	42	43	44	45	46	47	48	49	50
Voltage at stop mode (Voltage at play mode)	0	0	0	Fluctuation	Fluctuation	Fluctuation	Fluctuation	Fluctuation	−14.2	−14.2
Measuring pin No.	51	52	53	54	55	56	57	58	59	60
Voltage at stop mode (Voltage at play mode)	−14.2	−14.2	−14.2	−14.2	−14.2	−14.2	−16.5	4.9	0	1.6
Measuring pin No.	61	62	63	64						
Voltage at stop mode (Voltage at play mode)	2.1	4.4	4.9	4.9						

IC401 (CX23035)

(Unit: V)

Measuring pin No.	1	2	3	4	5	6	7	8	9	10
Voltage at stop mode (Voltage at play mode)	0	0(4.8)	0(2.6)	0(2.7)	2.1	2.5	–	2.3	2.3	–
Measuring pin No.	11	12	13	14	15	16	17	18	19	20
Voltage at stop mode (Voltage at play mode)	1.9	–	4.0	4.8	0.1	4.2	0.1	2.8	4.8(0)	0(4.8)
Measuring pin No.	21	22	23	24	25	26	27	28	29	30
Voltage at stop mode (Voltage at play mode)	0	1.5(0)	1.7	0	2.4	2.4	4.8(0)	0(4.8)	1.6	2.1
Measuring pin No.	31	32	33	34	35	36	37	38	39	40
Voltage at stop mode (Voltage at play mode)	2.3	2.1	4.8	2.2	1.7	1.7	3.0	2.4	2.4	2.4
Measuring pin No.	41	42	43	44	45	46	47	48	49	50
Voltage at stop mode (Voltage at play mode)	2.4	2.4	2.4	2.4	Fluctuation	Fluctuation	Fluctuation	Fluctuation	4.2	2.1
Measuring pin No.	51	52	53	54	55	56	57	58	59	60
Voltage at stop mode (Voltage at play mode)	1.8	–	2.4	2.4	1.8(0)	4.8(0)	4.8(0)	–	–	1.2
Measuring pin No.	61	62	63	64	65	66	67	68	69	70
Voltage at stop mode (Voltage at play mode)	1.2	2.6(0)	3.6(0)	1.9(0)	1.9(0)	4.7	2.4	2.4	1.5	1.7
Measuring pin No.	71	72	73	74	75	76	77	78	79	80
Voltage at stop mode (Voltage at play mode)	1.7	2.4	4.8	3.2	3.2	2.1	2.1	1.4	2.4	2.4

VOLTAGES OF ICS (2)

IC402 (TC5516AF2)

(Unit: V)

Measuring pin No.	1	2	3	4	5	6	7	8	9	10
Voltage at stop mode (Voltage at play mode)	Fluctuation	2.4	2.4	2.4	2.4	2.4	2.4	2.4	3.0	1.7
Measuring pin No.	11	12	13	14	15	16	17	18	19	20
Voltage at stop mode (Voltage at play mode)	1.7	–	2.2	2.1	2.3	2.1	1.6	2.1	Fluctuation	2.1
Measuring pin No.	21	22	23	24						
Voltage at stop mode (Voltage at play mode)	4.2	Fluctuation	Fluctuation	4.8						

IC403 (NJM082D)

(Unit: V)

Measuring pin No.	1	2	3	4	5	6	7	8
Voltage at stop mode (Voltage at play mode)	2.1	2.6	2.6	−10.4	0(2.4)	0(2.4)	−0.8	10.4

IC501 (CX20017)

(Unit: V)

Measuring pin No.	1	2	3	4	5	6	7	8	9	10
Voltage at stop mode (Voltage at play mode)	−5.0	−5.0	4.3	−4.9	−5.0	3.9	2.4	2.4	2.1	0
Measuring pin No.	11	12	13	14	15	16	17	18	19	20
Voltage at stop mode (Voltage at play mode)	0.4	2.4	–	−5.0	−3.7	−3.5	0	0	0	−5.0
Measuring pin No.	21	22	23	24	25	26	27	28		
Voltage at stop mode (Voltage at play mode)	–	–	−3.9	1.4	−1.2	−1.3	−1.3	–		

IC502/IC503 (M51008P)

(Unit: V)

Measuring pin No.	1	2	3	4	5	6	7	8	9	10
Voltage at stop mode (Voltage at play mode)	1.3	0	−5.0	–	4.9	0	0	−5.0	−5.0	0.4
Measuring pin No.	11	12	13	14						
Voltage at stop mode (Voltage at play mode)	4.9	–	−3.9	0						

IC504 (NJM4558D)

(Unit: V)

Measuring pin No.	1	2	3	4	5	6	7	8	9	10
Voltage at stop mode (Voltage at play mode)	0	0	0	−5.0	0	0	0	4.9		

IC701 (LB1275)

(Unit: V)

Measuring pin No.	1	2	3	4	5	6	7	8	9	10
Voltage at stop mode (Voltage at play mode)	0	0	0	0	0	0	0	–	2.9	0
Measuring pin No.	11	12	13	14	15	16				
Voltage at stop mode (Voltage at play mode)	0	0	0	0	0	0				

VOLTAGES OF TRANSISTORS

Transistors

Transistor No.	Q202			Q203			Q204		
Measuring pin name	E	C	B	E	C	B	E	C	B
Voltage at stop mode (Voltage at play mode)	0	10.4	−0.7	0	−10.5	−0.7	0	10.4	0.6
Transistor No.	Q205			Q206			Q207		
Measuring pin name	E	C	B	E	C	B	E	C	B
Voltage at stop mode (Voltage at play mode)	0	−10.5	0.6	0	10.4	0.6	0	−10.5	0.6
Transistor No.	Q208 *			Q301			Q303		
Measuring pin name	E	C	B	E	C	B	E	C	B
Voltage at stop mode (Voltage at play mode)	0	0 (−1.6, 2.4)	0.6 (−1.1, 0)	–	4.4	0	4.9	13.8	4.8
Transistor No.	Q401			Q402			Q501/Q502 **		
Measuring pin name	E	C	B	E	C	B	E	C	B
Voltage at stop mode (Voltage at play mode)	−0.1	10.4	−0.7	−0.1	−10.4	−0.7	–	0	−4.9(0.7)
Transistor No.	Q503/Q504			Q505			Q506 **		
Measuring pin name	E	C	B	E	C	B	E	C	B
Voltage at stop mode (Voltage at play mode)	–	0	0.6(4.9)	–	10.4(0)	0(0.6)	10.4	−4.9(10.0)	10.4(9.3)
Transistor No.	Q507			Q508			Q509		
Measuring pin name	E	C	B	E	C	B	E	C	B
Voltage at stop mode (Voltage at play mode)	6.7	2.4(−4.9)	6.7	–	6.7	0	2.4(4.9)	2.4(−4.9)	1.7(4.9)
Transistor No.	Q510			Q601			Q602		
Measuring pin name	E	C	B	E	C	B	E	C	B
Voltage at stop mode (Voltage at play mode)	–	0(4.9)	0.6(0)	4.9	10.1	5.5	−5.0	−10.1	−5.6
Transistor No.	Q603			Q604			Q605		
Measuring pin name	E	C	B	E	C	B	E	C	B
Voltage at stop mode (Voltage at play mode)	10.4	5.5	5.5	−5.6	−10.4	−10.4	−16.5	−24.7	−17.1
Transistor No.	Q621			Q631			Q632		
Measuring pin name	E	C	B	E	C	B	E	C	B
Voltage at stop mode (Voltage at play mode)	–	4.4	0	−0.3(−4.9)	−5.0	−0.2(−5.6)	–	−0.2(−5.6)	−0.6(2.4)

Notes: * (TRAY OPEN, TRAY CLOSE)
** (WITH EMPHASIS)

Technischer Kundendienst 029.9909

Sanyo CP900

BESTELL-NR.	0299909
GERAETEBEZEICHNUNG	SANYO-CD-PLAYER
WARENGATTUNG	656
AUSFUEHRUNGS-NR.	001
GERAETEBESCHREIBUNG	
PRIVILEG	CP 900
LIEFERANTEN-NR.	36569
PREIS	798.00
KATALOG	863
GARANTIEZEIT	6
KD-SEKTOR	R
HEIM/BRINGE	WERKSTATT
BETREUUNG	EIGEN
KOSTENTRAEGER	EIGEN
REPARATURFAEHIG	JA

ZEILE	POSITION	SYM	BEZEICHNUNG	ET-NUMMER
1				
2			SERVICE MANUAL UND ERSATZTEILE	
3			SIND BEI BEDARF UEBER KD-TB ZU	
4			BESTELLEN.	

ENDE

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